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Bids Invited for Purchase of Great Lakes

Bondholders Committee May Accept Offers for Fort William Plant Up Until Noon, September 20, When Bids Will Be Considered—Of Four Offers Already Reported, Two Are From U. S. Publishers, One From Hearst Interests and Another From Chicago Publishing Organization—Company's Mill Has Capacity of 650,000 Lbs. Daily

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., September 16, 1935—In the newsprint industry here interest at the present time is centered on the negotiations under way for the reorganization of the Great Lakes Paper Company, of Fort William, Ont. Offers for the purchase of this company have been invited by the receiver, the National Trust Company of Toronto, and the bondholders' committee may accept bids up till noon on September 20, when the bondholders are to meet to consider bids. The company's mill has a capacity of 650,000 lbs. of newsprint per day.

Possible Outcome Feared

Apprehension regarding the possible outcome of the present proceedings is voiced here by the *Financial Times* of Montreal, which says:

"United States publishing interests, who have been fighting Canadian newsprint producers in their efforts to stabilize the market for their product and obtain a reasonable price level—having failed where they succeeded last year in their attempts to break the ranks of the producers by dangling an attractive contract before "short-tonnage" mills—are now trying a new system. Of four bids reported to have been submitted for the assets of Great Lakes Paper Company to the National Trust Company in its capacity of receiver and manager for the bankrupt company at least two are known to be on account of United States publishing groups—one from the Hearst interests and one from a Chicago publishing organization.

"Neither of the two bids submitted by these publishing interests calls for the bringing into the Great Lakes Company of any new capital, both offers providing for the granting of a long term contract covering the full production capacity of the mill in exchange for a majority stock interest in the company. Under existing conditions of over-capacity in the newsprint industry such offers, no doubt, are tempting to bondholders of the company. Security-holders of the paper organization might profit, however, in their consideration of these offers by recalling the old warning to "beware of the Greeks bearing gifts."

"It is significant that the full capacity of the Great Lakes mill (approximately 100,000 tons annually) represents only about 20 per cent. of the yearly newsprint requirements of the Hearst organization. The question, therefore, arises, if Hearst interests would not find it profitable to use Great Lakes as a lever to keep the price of newsprint at its present unprofitable levels, even if such a policy meant that their stock holdings in the paper company would be rendered valueless thereby. Would not the lower price on the other 400,000 tons of newsprint consumed annually by the Hearst papers much more than offset any loss in potential return from the investment of the organization in Great Lakes Paper? That is a question being asked.

"There is a suggestion in advices from Toronto that the Ontario Government may intervene to prevent the mid-Western producer falling into the hands of any United States publishing group. In view of the direct interest of both Ontario and Quebec governments in the newsprint situation, the Hepburn administration would only be looking after its own interests, and those of Canadian labor and Canadian capital, by following such a policy.

"Great Lakes security holders, in considering these offers, might well remember that it is not only on patriotic grounds that they should be looked on with suspicion, although it might be supposed that even investors have patriotic sentiment on occasion. The question they must decide for themselves is whether their property is going to be used merely as a cat's-paw to further the ends of the interests submitting the bid."

Reconditioning Childsdale Mill

[FROM OUR REGULAR CORRESPONDENT]

GRAND RAPIDS, Mich., September 16, 1935.—Reconditioning of the paper mill at Childsdale is under way by the Pioneer Pulp and Paper Company, which has leased the property from its predecessor, Rogue River Paper Company.

H. E. Jones is president and general manager and E. H. Goodnaw, secretary-treasurer and general sales manager of the new company. The mill is equipped with one 68-inch Four Cylinder and will make plain chip, lined-board test-liner, news lined and .009 straw with a capacity of 40,000 lbs. in 24 hours.

Repair work has included reconditioning of the dam which went out early this summer and the erection of two new smoke stacks.

Plans are for work to begin within the near future if the organization and repair work can be completed.

Demand for Paper Irregular in Chicago

Various Standard Grades of Fine Paper Only Moderately Active—Kraft Paper Displays Strong Undertone—Some Improvement Transpires In Groundwood Paper Section—Steadiness Prevails In Paper Board Division—Paper Stock Moving Slowly

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., September 16, 1935—While a temporary lull is quite evident in a number of lines within the Chicago paper market, Chicago market observers seem to be retaining a confidence that business will materially strengthen with an anticipated increase in consumption. Demand has assumed a more consistent tone and will probably broaden out as evidence piles up that commodity prices are pointed into higher instead of lower grounds.

Certain lines in and around Chicago were improved over last week. Included among these were krafts, continuing to show strength, and groundwoods, who reported some clarification of the newsprint situation as being materially beneficial. Otherwise, all eyes were on various meetings being held in New York, Kalamazoo and Chicago during the present month. Fine paper were experiencing a noticable lull but point to business improvement and to a broadening out of advertising plans as indication of strength. Books and covers showed little change over the past week. Newsprint found reports of increased newspaper advertising lineage as a favorable note and, in general, seemed more optimistic. Paper board remained steady. Waste papers showed little inclination to move, probably closely following the general market conditions.

Dr. Merchant Addresses Paper Salesmen

Dr. E. O. Merchant, secretary of the Salesmen's Association of the Paper Industry and of the Groundwood Paper Manufacturers Association, spoke at the Monday, September 9 meeting of the midwest division, held in Chicago. The well known economist and statistician took the opportunity to place present business conditions squarely under the microscope, his discussion of present affairs and future possible developments giving both sides of the argument and permitting the local sales executives to draw their own conclusions.

The pessimistic side, as revealed by Dr. Merchant, centered around the grave dangers of uncontrolled inflation. He assured those present that there would not be any serious trouble about getting prices up into the higher range but that the chief threat would be prices soaring out of reach. This was taken as a hopeful note in relation to paper prices—with the provision that they and other commodity prices be kept within bounds.

Dr. Merchant compared conditions in 1920 with those of today and found many points of similarity by giving the position of various business indices and resultant developments on into the years of peak prices. While overexpansion was said by Dr. Merchant to be the chief fear and the most pessimistic note, he did feel that a properly controlled development would bring about the probable end of the depression.

The salesmen utilized the remainder of the session to give their weekly reports on business conditions and to complete plans for the Annual Fall Outing to be held at Olympia Fields on September 27 in conjunction with the meetings of the National Paper Trade Association.

Association Activities

The Groundwood Paper Manufacturers Association held an important meeting at the Blackstone Hotel, Chicago, on September 10. Under the supervision of Dr. E. O. Merchant, secretary, the Board of Governors met in the morning while a general meeting of the association took up the entire afternoon of the same day.

The Kraft Paper Association will hold one of its regular meetings on September 18 at the Drake Hotel. According to advance reports, this will be a morning session with a very representative attendance. The book paper executives met at Kalamazoo on September 11.

Another meeting which is creating interest is that of the Folding Paper Box Association to be held at the Edgewater Beach Hotel on September 18 and 19.

Naturally, major interest is centering in the Fall convention of the National Paper Trade Association, scheduled for the Hotel Stevens, Chicago, the last week in September. Chicago executives in the various divisions are convinced that the program will be more important and beneficial and the attendance better than that experienced by any meeting during the past few years.

News of the Industry

An interesting seasonal note is struck by the Swigart Paper Company in its most recent mailing to customers. Printed on Sulgrave plate finish, an envelope stuffer contains a reproduction of a bunch of grapes and the single word "Autumn." Sulgrave is reported as excellent for booklets, catalogues, folders and broadsides of a seasonal nature. The same mailing also includes an offer of a special lot of white wove envelopes with actual samples enclosed.

W. J. Tilden Joins Mead Sales

W. J. "Bill" Tilden, for five years identified with the Chicago sales office of the Eastern Manufacturing Company, has resigned from that position, effective September 15, and will become a member of the sales force of the Mead Sales Corporation, Chicago.

According to George Fay, of the Mead organization, Mr. Tilden will cover virtually the same territory as he has in the past. Mr. Tilden began his business career with International and during his connections with Eastern and International has gained a great deal of valuable experience in the paper field.

Bob Butterworth Improving

Bob Butterworth, for many years identified with the Chicago office of the Champion Coated Paper Company, has been ill for some time following the effects of a paralytic stroke. At this date he is reported as showing some improvement, gratifying news to the hundreds of friends and acquaintances of Mr. Butterworth within the paper industry.

To Be Control Superintendent

[FROM OUR REGULAR CORRESPONDENT]

FORT WILLIAM, Ont., September 16, 1935.—Effective September 1, R. A. Wheatley has been appointed control and service superintendent of the Great Lakes Paper Company, Ltd. E. N. Hunter will continue to be associated with this department in an advisory capacity.

Paper Business Expands In Philadelphia

Demand for Various Grades of Fine and Coarse Papers Attains Proportions That Exceed Estimates for August Program—Paper Stock Attracts More Mill Interest Than of Late—Quotations on Several Grades of Waste Paper Advance

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., September 16, 1935—Assuming a quicker pace than a week earlier the general expansion of business in both fine and coarse divisions of the paper trade attained proportions that exceeded estimates set for the initial fall program as forecast in these columns several months ago. Wholesale and retail sales are markedly ahead of the most sanguine expectations.

Those in the paper stock trade here enjoyed for the first time in a few years a betterment which, however, has been in the offing for some time past. Prices are firmly maintained and the market continues to develop activity along fairly broad lines. A very healthy interest is evinced by buyers and supplies are being absorbed in sizable tonnage. The material buyers are buying because they are in need of material; activity in the industry is increasing at a steady pace, and mills are stepping up production operations to better than 60 per cent.

The outstanding developments in the past week were the advancing prices in No. 1 New Manila from $1.35 to $1.50; Container Manila from .45 to .50; No. 1 Mixed Paper from .25 to .30; Straw Board Chip from .30 to .40; Binders Board Chip from .30 to .40; Corrugated Board from .50 to .55; Overissue News from .50 to .60 and Old Newspapers from .30 to .40.

Association Activities

Harry S. Platt, Philadelphia representative of Denney Tag Company, and president of Philadelphia Paper and Cordage Association, Inc., announced that there is a real treat in store for all those attending the first pre-winter meeting of the association which will be held at the Adelphia Hotel, Friday, September 20. Baseball—a sport that is dear to every man's heart—will be discussed pro and con by Howard Ehmke, veteran pitcher of the Philadelphia Athletics and hero of 1929 World's Series in Chicago.

In an interview with T. H. B. Smythe, president of the J. L. N. Smythe Company, and immediate past president of the Paper Trade Association of Philadelphia, Mr. Smythe stated: "Paper merchants must realize that starting January 1, 1936, they are going to have new and greater Federal and State taxes than ever before, and if they do not consider these taxes as part of their costs in the earlier months of the year they will find at the close of 1936, when they pay these new taxes which they mistakenly have not included, that they will be in the Red."

Norbert A. Considine, president of The Paper House of Pennsylvania, and of the Paper Trade Association of Philadelphia, together with W. B. Kilhour, Jr., of the Quaker City Paper Company; and Nathaniel Saxe, of the Saxe Paper Company, are leaving this city in a few days to be in attendance at the convention of the National Paper Trade Association to be held in Chicago from September 23 to 26. Messrs. Considine and Saxe will go by airplane from Philadelphia, while Mr. Kilhour will travel by train.

News of the Industry

Sylvester Garrett, who formerly conducted a paper house under his own name at 259 South Third street, is now connected with Garrett-Buchanan Company, as salesman in the wrapping paper division.

Garrett-Buchanan Company are now showing a marvelous new line of Christmas stationery and greeting cards for the holiday season.

Henry Conradi, of Garrett-Buchanan Company, is expected back at his desk sometime this week, after a vacation of two weeks during which he attended a convention of Veterans of the Foreign War in Baltimore.

William B. Kilhour, Jr., and Nathaniel Saxe have been on the sick list this past week but are now fully recovered and back at their desks.

At a meeting of the Board of Directors of the Wilmington Chamber of Commerce this past week, a communication was read from Mayor Walter W. Bacon, expressing his appreciation, among other things for their work in securing three new industrial plants to locate in Wilmington, the first named being the Cleveland Container Company. At this same meeting, the Cleveland Container Company was one of seventeen elected to membership in the Chamber of Commerce.

New Speed Control Book

The Reeves Pulley Company, sole manufacturers of Reeves variable speed transmission, has just issued a new speed control book with complete authoratitive information on modern methods of variable speed regulation for industrial machines of all types.

Even a casual examination impresses one with the fact that this book treats its subjects in a very thorough manner. It explains the necessity of variable speed control in modern manufacturing processes, outlines the development of methods of speed control, points out the qualifications that modern speed control equipment must possess, and describes and illustrates in detail the Variable Speed Transmission and Vari-Speed Motor Pulley.

There are sections on the many types of units available, remote and automatic control, on use of the Transmission by machine designers as standard equipment, 18 pages of illustrated applications of the unit in specific industries, practical engineering information with dimension drawings and tables that enable the manufacturer to plan his own applications, altogether, 112 pages of helpful information that will be sent free on request to the Reeves Pulley Company, Columbus, Ind.

Pressure Vessels, Fabricated Plate Work

This four-page bulletin deals with a variety of pressure vessels and fabricated plate work as furnished by Combustion Engineering Company, Inc., New York for various process industries. It includes such equipment as rotary digesters for pulp and paper manufacture, stripping columns and bubble towers for oil refining, autoclaves for chemical processing, creosoting cylinders, crystallizers for raw sugar, lead jacketed pots for chemical process, hydraulic cylinders and chrome-iron tanks for tank cars. Both welded and riveted construction are covered and the shop facilities for producing, annealing and X-raying such equipment are reviewed.

Census of Pulp and Paper Manufacture 1933

The following is the final report of the census of pulp and paper manufacturers for 1933 issued by the U. S. Department of Commerce. Preliminary reports for these industries were issued October 30 and December 13, 1934.

The "Pulp" industry embraces establishments engaged primarily in the manufacture of pulp made from wood and other fiber. The greater part of the pulp produced is consumed in paper mills operated by the same establishments.

The "Paper" industry embraces establishments engaged primarily in the manufacture of paper and paperboard. The principal material is wood pulp, the greater part of which is manufactured in pulp mills operated in conjunction with the paper mills. Small quantities of pulp made from rags, waste paper, straw, and other fibers of various kinds are also used.

All the establishments in the "Pulp" industry that reported at the census for 1931 were accounted for in the canvass for 1933. The 1933 coverage of the establishments reporting in the "Paper" industry for 1931 was nearly complete. Of the 650 such establishments, 14 failed to supply any information in regard to their status (active, idle, etc.) or their activities in 1933, but these establishments accounted for only a fraction of 1 percent of the total number of wage earners and of the total value of products reported for the industry for 1931.

TABLE I.—SUMMARY FOR THE UNITED STATES, 1927 TO 1933, AND FOR STATES, 1933 AND 1931

PULP	Number of establishments	Number of salaried employees [1] [2]	Number of wage earners (average for the year)	Salaries [2]	Wages	Cost of materials, fuel, and purchased electric energy	Value of products	Value added by manufacture [3]
				Thousands of dollars				
United States								
1933	[4] 181	1,573	20,074	3,293	18,103	81,896	134,692	52,796
1931	[4] 198	(5)	20,219	(5)	22,844	110,668	166,559	55,891
1929	[4] 198	1,885	24,729	5,844	32,679	148,753	238,928	90,176
1927	[4] 219	2,095	24,794	5,963	31,527	151,325	218,198	66,873
States								
Louisiana:								
1933	6	74	1,239	101	1,020	4,595	7,834	3,239
1931	6	(5)	847	(5)	915	3,349	5,859	2,510
Maine:								
1933	25	156	2,769	362	2,684	14,354	18,669	4,316
1931	26	(5)	3,134	(5)	3,830	22,255	28,849	6,594
Massachusetts:								
1933	3	5	123	10	101	362	513	151
1931	3	(5)	209	(5)	219	747	1,190	442
Michigan:								
1933	10	78	821	149	715	2,940	5,281	2,341
1931	10	(5)	685	(5)	776	4,325	6,146	1,822
Minnesota:								
1933	6	44	741	79	595	3,275	4,467	1,192
1931	6	(5)	495	(5)	562	3,493	4,900	1,407
New York:								
1933	36	149	1,813	278	1,510	8,933	12,678	3,746
1931	45	(5)	2,022	(5)	2,282	13,812	19,147	5,335
Oregon:								
1933	5	30	634	66	572	2,681	5,040	2,359
1931	7	(5)	704	(5)	919	4,123	5,740	1,617
Pennsylvania:								
1933	7	140	1,015	352	886	3,604	6,294	2,690
1931	9	(5)	1,105	(5)	1,224	6,937	10,186	3,249
Tennessee:								
1933	6	45	497	123	414	1,827	3,762	1,935
1931	6	(5)	515	(5)	548	2,484	4,711	2,227
Vermont:								
1933	3	2	58	(6)	43	229	354	125
1931	3	(5)	75	(5)	90	428	534	106
Virginia:								
1933	9	113	1,293	236	1,167	5,445	10,136	4,691
1931	8	(5)	1,299	(5)	1,244	6,046	10,574	4,528
Washington:								
1933	15	223	1,993	517	2,134	9,698	18,875	9,178
1931	17	(5)	2,155	(5)	2,877	11,449	17,757	6,308
Wisconsin:								
1933	27	283	2,897	569	2,552	11,877	18,960	7,083
1931	27	(5)	2,807	(5)	3,269	16,828	25,127	8,300
Other States: [7]								
1933	23	231	4,182	451	3,711	12,077	21,828	9,751
1931	25	(5)	4,167	(5)	4,088	14,391	25,838	11,447
PAPER								
United States								
1933	[8] 600	9,081	87,224	19,349	81,091	311,767	560,963	249,195
1931	[8] 650	(5)	87,683	(5)	104,042	384,420	684,971	300,551
1929	[8] 685	11,744	103,320	37,624	140,398	574,608	967,186	392,578
1927	[8] 710	10,537	98,566	33,619	130,475	572,786	919,891	347,106
States								
California:								
1933	10	184	1,579	400	1,746	4,879	10,586	5,707
1931	11	(5)	1,556	(5)	2,097	6,103	11,692	5,589
Connecticut:								
1933	22	155	1,349	376	1,450	4,325	8,249	3,924
1931	27	(5)	1,738	(5)	2,066	4,800	9,800	5,000
Illinois:								
1933	25	268	2,868	585	2,848	8,844	18,388	9,544
1931	25	(5)	3,092	(5)	3,658	10,592	20,172	9,579
Indiana:								
1933	20	201	1,687	397	1,518	5,187	9,811	4,624
1931	21	(5)	1,586	(5)	1,760	5,639	10,109	4,470
Louisiana:								
1933	7	95	1,250	141	1,065	8,387	16,402	8,016
1931	9	(5)	1,060	(5)	1,167	8,235	13,621	5,386
Maine:								
1933	25	662	6,950	1,454	6,430	26,847	44,356	17,509
1931	26	(5)	6,992	(5)	8,672	40,899	67,792	26,893
Maryland:								
1933	5	75	1,253	152	1,103	3,932	6,824	2,892
1931	6	(5)	1,135	(5)	1,124	4,518	6,936	2,417
Massachusetts:								
1933	65	1,027	9,390	1,185	8,111	18,832	40,064	21,232
1931	74	(5)	10,443	(5)	11,742	27,152	56,959	29,807
Michigan:								
1933	39	944	9,850	2,093	8,820	31,069	56,326	25,258
1931	39	(5)	9,112	(5)	11,283	37,363	67,467	30,103
Minnesota:								
1933	8	190	1,415	394	1,386	7,542	10,329	2,787
1931	8	(5)	1,177	(5)	1,630	8,706	13,015	4,309

See footnotes at end of table.

PAPER	Number of establishments	Number of salaried employees [1] [2]	Number of wage earners (average for the year)	Salaries [2]	Wages	Cost of materials, fuel, and purchased electric energy	Value of products	Value added by manufacture [3]
				Thousands of dollars				
New Hampshire:								
1933	21	130	2,044	279	1,807	6,999	11,641	4,642
1931	21	(5)	1,828	(5)	2,116	9,393	13,965	4,571
New Jersey:								
1933	28	270	3,262	707	3,220	12,481	23,746	11,265
1931	36	(5)	3,763	(5)	4,669	12,138	25,382	13,244
New York								
1933	106	1,016	10,082	2,111	9,619	40,276	65,303	25,027
1931	120	(5)	10,987	(5)	13,579	53,082	90,515	37,433
Ohio:								
1933	48	1,018	7,729	2,241	7,491	27,769	47,563	19,794
1931	48	(5)	8,343	(5)	9,949	32,448	56,824	24,376
Oregon:								
1933	6	115	1,417	207	1,370	4,983	10,868	5,885
1931	6	(5)	1,229	(5)	1,410	6,378	13,624	7,246
Pennsylvania:								
1933	49	800	6,882	1,783	6,774	23,961	46,256	22,295
1931	51	(5)	6,270	(5)	7,420	31,278	53,579	22,301
Tennessee:								
1933	6	44	403	89	343	1,720	3,583	1,864
1931	6	(5)	545	(5)	661	2,690	4,501	1,811
Vermont:								
1933	9	48	629	103	640	2,581	4,320	1,739
1931	10	(5)	745	(5)	1,251	3,381	5,506	2,124
Virginia:								
1933	10	177	1,733	341	1,492	8,841	15,141	6,299
1931	10	(5)	1,674	(5)	1,706	12,072	16,848	4,775
Washington:								
1933	13	200	1,945	479	2,144	11,627	21,782	10,155
1931	13	(5)	1,901	(5)	2,586	10,082	26,532	16,450
West Virginia:								
1933	5	49	557	135	562	2,130	3,656	1,525
1931	6	(5)	596	(5)	668	2,230	4,004	1,774
Wisconsin:								
1933	44	1,027	9,327	2,048	7,987	34,767	58,041	23,274
1931	45	(5)	8,596	(5)	9,749	42,160	70,182	28,023
Other States: [9]								
1933	29	386	3,624	649	3,163	13,789	27,727	13,937
1931	32	(5)	3,315	(5)	3,078	13,081	25,949	12,868

[1] Not including proprietors and firm members, as follows "Pulp (wood and other fiber)" industry, 1933, 1; 1931, no data; 1929, 11; 1927, 7. "Paper" industry, 1933, 37; 1931, no data; 1929, 32; 1927, 38.

[2] The figures for 1933 do not include data for number and compensation of salaried officers of corporations, and therefore are not strictly comparable with the corresponding figures for 1929 and 1927, in which such data are included. No data for employees of central administrative offices are included in the figures for any year.

[3] Value of products less cost of materials, fuel, and purchased electric energy. See sec. 12, p. IV.

[4] The 181 establishments reporting for 1933 operated 185 mills (8 of which manufactured pulp from materials other than wood); the 198 establishments reporting for 1931 operated 204 mills (5 of which used materials other than wood); the 198 establishments reporting for 1929 operated 208 mills (3 of which used materials other than wood); for 1927, the number of establishments and the number of mills were identical.

[5] No data.

[6] Withheld to avoid disclosing compensation of an individual employee; included in figure for "Other States."

[7] States included and numbers of establishments reporting for 1933 and 1931, respectively, are: Ala., 2, 2; Ark., 1, 1; Del., 1, 1; Fla., 1, 1; Ind., 1, 0; Md., 1, 2; Miss., 2, 2; N. H., 4, 7; N. J., 1, 1; N. C., 3, 3; Ohio, 2, 2; S. C., 1, 1; W. Va., 3, 2.

[8] The 600 establishments reporting for 1933 operated 610 individual mills (combined reports having been made in a few cases for two or more mills operated by the same establishment); the 650 establishments reporting for

1931 operated 666 mills; the 685 establishments reporting for 1929 operated 702 mills; for 1927 the numbers of establishments and numbers of mills were identical.

[3] States included and numbers of establishments reporting for 1933 and 1931, respectively are: Ala., 3, 3; Ark., 1, 1; Colo., 1, 1; Del., 4, 6; D. C., 1, 1; Fla., 1, 1; Ga., 2, 2; Iowa, 2, 2; Kans., 2, 3; Miss., 2, 2; Mo., 2, 2; N. C., 4, 4; R. I., 1, 1; S. C., 2, 2; Tex., 1, 1.

TABLE II.—PULP—PRODUCTION, BY PROCESS, FOR CONSUMPTION AND FOR SALE, BY QUANTITY AND VALUE, FOR THE UNITED STATES: 1933, 1931, AND 1929

Process	Quantity (tons of 2,000 pounds)			Value in Thousands of Dollars [1]		
	1933	1931	1929	1933	1931	1929
"Pulp" industry, all products, total	.....	.....	.....	134,692	166,559	238,928
Pulp (wood and other fiber)	4,365,668	4,479,193	4,937,235	132,471	164,934	234,759
Products other than pulp (not normally belonging to the industry)	.....	.....	.....	2,220	1,625	4,169
Pulp (wood and other fiber), aggregate	4,365,668	4,479,193	4,937,235	132,471	164,934	234,759
For consumption [2, 3]	3,705,221	3,823,910	4,167,749	104,301	131,280	183,261
For sale [3]	660,447	655,283	769,486	28,171	33,655	51,498
Wood pulp, total	4,276,204	4,409,344	4,862,885	124,072	156,175	223,178
For consumption [2, 3]	3,664,556	3,789,204	4,122,515	100,873	127,607	177,097
For sale [3]	611,648	620,140	740,370	23,199	28,568	46,081
Mechanical, total	1,197,553	1,449,240	1,637,653	23,612	34,100	47,223
For consumption [3]	1,174,001	1,415,531	1,605,149	23,084	33,136	46,210
For sale	23,552	33,709	32,504	528	964	1,013
Sulphite fiber, bleached, total	726,473	740,812	839,953	33,366	42,308	62,153
For consumption [2]	478,135	470,904	549,685	22,080	26,706	37,719
For sale	248,338	269,908	290,268	11,287	15,602	24,434
Sulphite fiber, unbleached, total	601,102	676,711	[4] 848,754	21,143	28,054	[4] 41,078
For consumption [3]	454,076	529,599	[4] 685,990	15,800	23,097	[4] 33,246
For sale	147,026	147,112	162,764	5,343	4,957	7,832
Sulphate fiber, total	1,259,351	1,033,439	[4] 910,888	29,096	28,840	[4] 36,908
For consumption [3]	1,171,545	971,148	[4] 794,685	26,930	27,055	[4] 32,298
For sale	87,806	62,291	116,203	2,166	1,784	4,610
Soda fiber, semichemical and other, for consumption and for sale	457,790	460,682	561,210	16,471	22,181	34,862
Screenings, mechanical for consumption and for sale	4,243	10,115	11,459	45	96	145
Screenings, chemical, total	29,692	38,345	52,968	339	596	809
For consumption [3]	19,572	21,932	37,335	233	293	526
For sale	10,120	16,413	15,633	106	303	283
Other pulp, [5] total	89,464	69,849	74,350	8,399	8,759	11,581
For consumption [3]	40,665	34,706	45,234	3,427	3,673	6,164
For sale	48,799	35,143	29,116	4,972	5,086	5,417

[1] See sec. 13, p. IV.

[2] Wood pulp made and consumed in the same plants or transferred to and consumed in other plants operated by the same companies.

[3] Data for a small quantity of mechanical screenings for sale are included in the 1933 figures, and data for small quantities of semichemical pulp and mechanical screenings for sale are included in the 1931 and 1929 figures, to avoid disclosing approximations of amounts made for sale by individual establishments.

[4] Revised.

[5] Principally cottonseed-hull-fiber pulp, cotton-linters pulp, rag pulp, and reclaimed paper pulp.

TABLE III.—WOOD-PULP PRODUCTION, BY QUANTITY, PROCESS, AND CONDITION, FOR THE UNITED STATES: 1933, 1932, 1931, AND 1929

Process and Condition	Quantity (tons of 2,000 pounds)			
	1933	1932	1931	1929
Aggregate	4,276,204	3,760,267	4,409,344	4,862,885
Mechanical, total	1,197,553	1,203,044	1,449,240	1,637,653
Not steamed	1,079,066	1,133,964	1,363,726	1,474,415
Steamed	118,487	69,080	85,514	163,238
Sulphite, total	1,327,575	1,145,639	1,417,523	1,688,707
Unbleached	601,102	548,702	676,711	848,754
Bleached	726,473	596,937	740,812	839,953
Sulphate, total	1,259,351	1,028,846	1,033,439	910,888
Unbleached	1,195,938	966,595	979,500	910,888
Bleached	63,413	62,251	53,939	
Soda fiber, semichemical and other	[1] 457,790	357,865	460,682	561,210
Screenings, total	33,935	24,873	48,460	64,427
Mechanical	4,243	278	10,115	11,459
Chemical	29,692	24,595	38,345	52,968

[1] Includes 346,738 tons of bleached soda pulp.

TABLE IV.—PULPWOOD CONSUMPTION, BY PROCESS, FOR THE UNITED STATES: 1933, 1932, 1931, AND 1929

Year	Quantity (cords)					
	Total	Mechanical	Sulphite	Soda	Sulphate	Semi-chemical
1933	6,581,674	1,110,105	2,568,160	665,470	2,118,049	119,890
1932	5,633,123	1,144,390	2,150,986	527,583	1,709,419	100,745
1931	6,722,766	1,371,389	2,781,685	685,520	1,770,940	113,232
1929	7,645,011	1,559,788	3,401,966	925,371	1,701,359	56,527

TABLE V.—PULPWOOD CONSUMPTION—QUANTITY AND COST, BY KIND OF WOOD, FOR THE UNITED STATES: 1933, 1931, AND 1929

Kind of Wood	Quantity (cords)			Cost		
	1933	1931	1929	1933	1931	1929
Total	6,581,674	6,722,766	7,645,011	$48,507,790	$73,524,059	$100,054,139
Spruce:						
Domestic	1,495,061	1,651,051	2,074,267	15,794,350	24,993,928	34,830,982
Imported	576,000	676,339	1,029,913	6,927,426	12,084,537	20,480,540
Yellow pine, Southern	1,560,414	1,294,503	1,036,272	6,864,202	7,818,012	7,841,759
Hemlock:						
Domestic	1,101,642	1,185,272	1,309,170	6,695,399	9,992,168	12,960,742
Imported	10,914	5,776	15,379	68,931	62,848	188,087
Balsam fir:						
Domestic	261,466	338,790	317,552	2,018,343	4,267,573	4,181,528
Imported	41,465	55,601	45,412	446,593	942,072	810,011
Poplar, domestic and imported	353,438	360,841	487,295	3,494,228	4,954,863	7,319,560
Jack pine [1]	178,974	159,273	205,760	1,223,037	1,473,898	2,280,854
Beech, birch, and maple, domestic	93,032	69,681	76,950	846,715	942,077	1,140,686
White fir, domestic	154,847	109,277	111,054	620,510	798,791	1,012,991
Tamarack (larch), domestic	21,844	35,433	51,835	147,479	398,605	618,728
Other woods [2]	252,436	222,886	322,867	1,606,622	1,764,349	3,437,802
Slabs and mill waste	480,141	558,043	561,285	1,753,955	3,030,338	2,949,869

[1] Domestic only for 1933; small quantities of imported wood included for 1931 and 1929.

[2] For 1933, domestic yellow poplar, chestnut, cottonwood, gum, Douglas fir, willow, basswood, white pine, and miscellaneous hardwoods not reported separately, and a small quantity of imported pine.

TABLE VI.—PAPER AND PAPERBOARD—PRODUCTION, BY KIND, QUANTITY, AND VALUE: 1933, 1931, AND 1929

	Quantity (tons of 2,000 pounds)			Value in Thousands of Dollars [1]		
	1933	1931	1929	1933	1931	1929
1. Paper industry, all products, total	.....	.....	.....	560,963	684,971	967,186
Paper and paperboard:						
2. Produced for sale	6,877,131	6,939,706	8,331,297	404,404	498,203	715,146
3. Produced for transfer to other plants of same companies	1,266,038	1,259,025	1,612,554	60,308	65,118	101,879
4. Products other than paper and paperboard (not normally belonging to the industry)	.....	.....	.....	96,250	121,650	150,161
5. Paper and paperboard produced for use in same plants	1,046,848	1,183,109	1,196,384	56,840	67,785	86,276
Paper and paperboard, aggregate (2, 3, 5) [2]	9,190,017	9,381,840	11,140,235	521,553	631,106	903,301
Newsprint and similar paper, total	1,213,096	1,514,543	1,772,591	47,837	86,143	109,315
Newsprint, standard, in rolls and sheets	928,332	1,203,263	1,409,169	32,206	63,654	80,707
Hanging paper	66,137	85,974	101,002	3,346	5,800	7,294
Catalog paper	62,954	89,382	111,771	4,250	7,064	9,571
Poster, novel, newstablet, lining, etc.	155,673	135,924	150,649	8,035	9,624	11,743
Book paper, total	1,080,196	1,208,674	1,497,912	83,244	120,283	168,272
Machine-finished, sized, and supercalendered	802,248	952,142	1,176,596	60,837	94,978	131,852
Body stock for coated paper	176,513	199,946	250,234	13,606	18,345	26,756
Lithograph	16,737	10,036	19,877	1,479	1,081	2,417
Offset	26,515	23,454	26,304	2,913	3,146	3,847
Text	5,699	23,096	[3]	767	2,732	[3]
Other book paper	52,484		24,901	3,641		3,400
Cover paper	12,697	23,520	28,072	2,104	4,372	6,430
Writing paper, total	478,356	487,598	607,590	61,330	77,865	113,224
Rag-content	65,998	79,718	118,619	19,507	26,959	42,653
Sulphite bond	282,766	246,971	284,609	29,247	31,304	41,724
Other chemical wood-pulp writing papers	129,592	160,909	204,362	12,577	19,602	28,846

	Quantity (tons of 2,000 pounds)			Value in Thousands of Dollars [1]		
	1933	1931	1929	1933	1931	1929
Wrapping paper, total	1,440,029	1,401,667	1,605,783	95,768	110,885	163,442
Sulphite	267,487	199,780	215,777	18,706	17,605	20,975
Sulphate (kraft)	932,598	867,743	846,468	51,675	58,715	79,911
Greaseproof	15,671	10,774	7,965	2,746	1,756	1,608
Glassine	38,441	37,666	47,438	7,132	6,685	9,737
Vegetable and other imitation parchment	9,186	285,704	488,135	1,184	26,125	51,211
Other wrap'g paper	176,646			14,324		
Tissue paper, total	406,760	394,623	387,811	37,711	45,041	53,300
Total	202,861	150,652	142,725	16,034	14,320	15,103
Other tissue paper	203,899	243,971	245,086	21,678	30,721	38,197
Absorbent paper, total	79,832	76,592	90,800	12,082	14,774	16,973
Blotting	7,045	9,565	14,125	1,058	1,776	2,828
Other absorbent paper	72,787	67,027	76,675	11,024	12,998	14,145
Building paper, total	328,275	395,359	661,898	14,060	18,129	39,483
Sheathing	22,288	26,341	52,205	1,480	791	2,215
Asbestos and asbestos-filled	20,449	44,002	66,807	1,373	3,011	4,616
Rag felts and other building papers	285,538	325,016	542,886	11,207	14,327	32,652
Other paper	74,486	31,441	36,591	6,236	4,501	5,121
Paperboard, total	4,076,290	3,847,823	4,451,187	161,181	149,112	227,742
Container boards	2,020,617	1,903,792	2,255,537	72,271	62,155	99,163
Folding boxboards (bending)	957,626	905,710	991,285	38,567	37,947	53,150
Set-up boxboards (nonbending)	571,898	562,176	599,665	19,708	16,055	23,044
Binders' board	26,429	32,703	64,165	1,563	2,177	4,675
Cardboard	71,667	74,102	47,233	6,744	8,046	4,922
Leatherboard	21,437	26,715	24,228	1,799	2,581	2,942
Pressboard	7,241	4,000	11,901	1,168	823	2,480
Other boards [4]	399,375	338,625	457,173	19,361	19,327	37,365

[1] See sec. 13, p. IV.

[2] Figures include data for paper and paperboard used in the manufacture of converted paper products in the plants that produced the paper and paperboard as follows: 1933, 1,046,848 tons, valued at $56,840,299; 1931, 1,183,109 tons, $67,785,320; 1929, 1,196,384 tons, $86,276,477.

[3] No data.

[4] Figures include data for building boards, as follows: 1933, 58,048 tons, valued at $2,783,402; 1931, 112,049 tons, $6,995,825; 1929, 143,129 tons, $13,834,412.

TABLE VIII.—WAGE EARNERS, BY QUARTERS, FOR SELECTED STATES, FOR THE "PAPER" INDUSTRY: 1933 AND 1931

[The average for the year (table 1) differs from the average of the quarterly figures below (see fourth sentence sec. 9, p. III). See sec. 15, p. IV.]

	1933 [1]				1931			
	March	June	Sept.	Dec.	March	June	Sept.	Dec.
United States	77,393	83,044	99,266	95,676	89,620	87,791	86,547	83,731
States								
California	1,339	1,454	1,895	1,763	1,576	1,581	1,583	1,464
Connecticut	1,214	1,269	1,547	7,455	1,799	1,742	1,682	1,661
Delaware	206	149	186	184	437	391	365	286
Illinois	2,293	2,677	3,504	3,172	3,218	3,132	3,080	2,775
Indiana	1,256	1,485	2,404	1,922	1,675	1,535	1,637	1,506
Louisiana	951	1,204	1,562	1,545	1,039	926	863	780
Maine	6,544	6,750	7,417	7,291	7,111	7,149	6,850	6,590
Maryland	1,122	1,267	1,346	1,362	1,151	1,109	1,108	1,120
Massachusetts	8,956	9,134	9,933	9,985	10,928	10,350	10,187	10,181
Michigan	8,566	9,472	11,443	10,706	9,222	9,281	8,819	8,280
Minnesota	1,309	1,328	1,630	1,671	1,235	1,099	1,041	1,255
New Hampshire	1,943	1,965	2,284	2,105	1,852	1,815	1,861	1,810
New Jersey	2,911	3,136	3,609	3,581	3,756	3,824	3,814	3,606
New York	9,175	9,677	11,202	10,680	11,299	10,779	10,818	10,677
Ohio	6,688	7,151	9,148	8,654	8,510	8,476	8,369	7,962
Oregon	1,167	1,228	1,550	1,754	1,125	1,310	1,267	1,254
Pennsylvania	5,967	6,498	7,883	7,667	6,360	6,294	6,263	6,043
Tennessee	328	346	493	481	549	558	552	531
Vermont	584	601	681	707	770	743	718	738
Virginia	1,490	1,640	2,067	1,999	1,688	1,670	1,663	1,614
Washington	1,681	1,904	2,290	2,196	1,988	1,913	1,895	1,859
West Virginia	507	537	578	597	580	586	614	595
Wisconsin	8,567	9,101	10,197	9,883	8,693	8,574	8,545	8,403

[1] See sec. S. 7 and 9, p. III. The 545 establishments canvassed with the standard schedule reported wage earners, by months, as follows:

January	75,501	May	78,322	September	97,614
February	76,534	June	81,638	October	97,103
March	76,153	July	86,188	November	94,669
April	76,952	August	94,187	December	94,046

TABLE VII.—WAGE EARNERS, BY MONTHS, FOR SELECTED STATES, FOR THE "PULP (WOOD AND OTHER FIBER)" INDUSTRY: 1933 AND 1931

[For average for the year, see Table I. The month of maximum employment is indicated by **bold-faced** figures and that of minimum employment by *italic* figures. See sec. 15, p. IV.]

	Number reported for											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
UNITED STATES												
1933	17,761	17,870	*17,681*	17,973	18,449	18,911	19,421	20,900	22,736	**23,091**	23,025	23,072
1931	20,349	20,778	20,769	**20,944**	20,825	20,491	20,367	20,027	19,678	19,738	19,539	*19,122*
STATES												
Louisiana:												
1933	*904*	948	915	939	948	1,090	1,233	1,480	1,588	1,573	1,606	**1,639**
1931	807	875	942	828	816	*774*	960	**988**	779	961	831	*597*
Maine:												
1933	2,607	2,639	2,618	2,562	2,579	*2,499*	2,575	2,859	2,943	3,110	**3,130**	3,109
1931	3,309	**3,310**	3,212	3,192	3,275	3,284	3,189	3,067	3,093	2,922	2,911	*2,845*
Massachusetts:												
1933	122	112	106	*104*	108	112	113	110	146	146	**147**	144
1931	209	212	**216**	214	214	214	212	208	204	204	201	*200*
Michigan:												
1933	*731*	736	755	799	786	801	784	859	883	**942**	893	884
1931	*653*	660	668	**736**	701	679	664	674	676	691	698	719
Minnesota:												
1933	672	680	682	744	791	803	*725*	*666*	**830**	773	760	762
1931	*412*	413	489	511	480	541	**567**	505	447	484	553	534
New Hampshire:												
1933	866	848	792	817	828	771	*746*	876	**936**	894	867	851
1931	**1,397**	1,309	1,165	1,214	1,200	1,091	952	885	*802*	837	829	840
New York:												
1933	1,686	1,654	*1,540*	1,577	1,704	1,745	1,813	1,905	1,964	1,981	2,062	**2,120**
1931	2,019	1,975	2,136	**2,192**	2,115	1,916	2,006	2,044	2,051	1,964	1,940	*1,911*
North Carolina:												
1933	1,049	1,043	1,065	1,057	*1,042*	1,073	1,074	1,173	1,250	1,267	1,284	**1,292**
1931	1,180	1,174	1,177	1,176	**1,184**	1,178	1,180	1,176	1,182	1,180	*1,099*	1,102
Oregon:												
1933	611	591	595	575	*552*	**567**	622	588	657	721	745	**788**
1931	754	757	787	739	**806**	773	663	606	*605*	612	610	738
Pennsylvania:												
1933	920	940	922	*913*	915	925	995	1,123	1,129	1,147	**1,148**	1,104
1931	1,099	**1,190**	1,136	1,077	1,096	1,086	1,103	1,068	1,128	1,140	1,087	*1,051*
Tennessee:												
1933	424	423	417	*411*	421	533	456	524	573	599	**605**	573
1931	540	512	503	498	482	*450*	489	504	519	560	561	**562**
Vermont:												
1933	59	49	48	72	48	58	57	*24*	53	70	75	**87**
1931	*57*	62	62	86	88	79	67	67	67	83	**90**	88
Virginia:												
1933	1,101	1,092	*1,056*	1,075	1,105	1,221	1,263	1,391	1,515	**1,617**	1,526	1,559
1931	*1,184*	1,220	1,290	1,329	1,344	**1,356**	1,324	1,333	1,346	1,331	1,308	1,226
Washington:												
1933	1,588	*1,587*	1,666	1,763	1,802	1,869	1,933	2,106	2,357	2,364	**2,440**	2,439
1931	2,016	2,106	*2,014*	2,250	2,299	**2,311**	2,245	2,195	2,067	2,048	2,152	2,154
West Virginia:												
1933	*523*	540	549	554	550	555	564	580	594	595	589	**609**
1931	*486*	488	505	513	525	578	579	577	**581**	574	570	563
Wisconsin:												
1933	*2,662*	2,730	2,685	2,733	2,724	2,799	2,905	2,984	**3,221**	3,199	3,060	3,062
1931	**2,945**	2,924	2,886	2,844	2,785	2,782	2,757	*2,699*	2,741	2,778	2,794	2,748

Obituary

James L. Carey

James L. Carey, well known paper mill engineer and architect, died suddenly Monday, September 9, at his summer home near Kenosha, Wis. Mr. Carey was born May 17, 1864, at Menasha, Wis. He was graduated in 1888 from the University of Wisconsin with the degree of mechanical engineer. Immediately upon leaving college he became connected with the Black-Clawson Company, paper machinery builders, of Hamilton, Ohio. From 1907 when he entered business for himself he designed numerous pulp and paper mills throughout the country, including the American Coating Mills, Elkhart, Ind.; Container Corporation of America, Chicago, Ill., and Cincinnati, Ohio; Consolidated Paper Company, Aurora, Ill.; Hummel & Downing Company, Milwaukee, Wis.; Michigan Carton Company, Battle Creek, Mich.; Northwest Strawboard Mills, Quincy, Ill.; Bemis Bro. Bag Company, Peoria, Ill.; Central Fibre Products Company, Hutchinson, Kans. and the Pioneer-Flintkote Company, Los Angeles, Cal.

Among his clients also he included the Australia Paper Mills, Ltd., Melbourne and Sidney, Australia; Chin Hua Card Board and Paper Manufacturers, Tientsin, China, and the Alliance Box Company of Warrington, England.

Mr. Carey joined the Technical Association of the Pulp and Paper Industry in 1916 and also was a member of the Western Society of Engineers, the Butterfield Country Club, Hinsdale, Ill., and was a life member of the University of Wisconsin Alumni Association.

The funeral services were held Wednesday, September 11, from his late home in Chicago.

Thomas J. Allen

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., September 14, 1935—Widespread regret was experienced by many friends and associates in the paper business at the announcement of the death of Thomas J. Allen, vice-president and secretary of Paper Sales, Ltd., King street West, Toronto,

Deceased, who was justly popular among a wide circle of friends in the wholesale paper trade of the province, was born and educated in Amherst, N. S., and was a graduate of the College of Pharmacy, Boston, Mass.

He joined Paper Sales organization in 1917, becoming vice-president two years later and retaining that position to the time of his death.

He was prominent in Masonic circles and was a member of Robert Lash Lodge, A. F. and A. M., Boston.

He was a member of Cedar Brook Golf Club. Only his widow survives. The funeral took place at Bracebridge, Ont., his wife's home.

John Francis Ryan

NIAGARA FALLS, N. Y., September 14, 1935—John Francis Ryan, veteran Canadian paper mill superintendent, died here this morning. He was 70 years old.

In 1931 he retired as general superintendent of the Ontario Paper Company, Ltd., of Thorold, Ont. He was born in Paterson, N. J.

For a number of years he was with the International Paper Company. Associated with the late Warren Curtiss, he was one of the founders of the Ontario Paper Company, with which he was connected more than twenty years.

Surviving are his widow, a daughter, Miss Anna M. Ryan, of New York; three brothers, William F. and James J. Ryan of Fitchburg, Mass., and Michael T. Ryan, of Boston.

Howard L. Brooks

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., September 17, 1935—Word has been received here of the death at Pasadena, Cal., of Howard L. Brooks who had been engaged in the paper manufacturing business over 50 years.

Mr. Brooks was superintendent of the Crocker-McElwain Company for a number of years when he retired; but inactivity did not suit and he returned to the firm until his retirement a year ago when he went to Pasadena where his son J. Lemand is in business.

He was the only son of the late John R. Brooks of West Springfield and a descendant of William Brooks who came to this country from England in 1645 and settled in Springfield in 1649.

Defiance to Discontinue Making Paper

The sale by the Defiance Paper Company, of Niagara Falls, N. Y., of its paper and pulp mill machinery to the International Paper Company was briefly mentioned in the PAPER TRADE JOURNAL last week. In connection with this transaction, T. N. Uptegraff, president and treasurer of the company, has issued the following statement:

"The Defiance Paper Company has sold its paper and pulp making machinery to the International Paper Company. It has also sold its wrapping paper business to the same company, but the Defiance Paper Company will retain all the buildings, real estate and all the other machinery.

"The Niagara Wall Paper Company has made a contract with the International Paper Company for its requirements of paper and will continue its operation the same as it has in the past, using the buildings formerly occupied by the Defiance Paper Company for additional storage purposes and will have them available for future expansion of its activities.

"The paper mill will continue its operations until the present supply of raw materials are consumed, which will take about two weeks, at which time it will be closed permanently. The machinery will be promptly removed from the buildings.

"The sale of this paper and pulp making machinery does not in any way affect the operations of the Niagara Wall Paper Company, except that it provides additional buildings for their use, which can be utilized for storage purposes and additional manufacturing facilities. The Niagara Wall Paper Company and Defiance Paper Company will continue to be managed and owned by the same interests that previously managed and owned them."

William J. Brown Serves 44 Years

William J. Brown, on September 25, will enter on his forty-fourth year of service with the St. Maurice Valley Paper Company, successors to the Laurentide Company, Ltd. He entered the employ of the latter company September 22, 1891 as a junior clerk and has served in every department of the mill. During the past thirty-five years he has been on the sales force. During this long period he has made for himself a large number of friends among publishers and the paper trade in general. His many friends trust that he will be spared for many years to come to render valuable service to both the company and its clients.

Plans for Packaging Exposition

More than two thirds of the space covered by the Fifth Packaging Exposition has been sold to the Sixth Packaging Exposition which does not open for six months, according to Alvin E. Dodd, managing director of the American Management Association, under the auspices of which the Exposition is being held at the Hotel Pennsylvania, New York, March 3-6 inclusive. More than 30 exhibitors, a third of whom are from the Middle West, have taken space since the initial announcement of the 1936 Exposition was sent out the middle of August from the exposition headquarters at 232 Madison avenue, New York.

That the exposition will exemplify every phase of modern packaging is indicated by the wide variety of exhibitors, according to Mr. Dodd. Displays will include corrugated boxes, set-up boxes, glass and fibre containers, celluloid, transparent cellulose, machinery, paper, foil, adhesives, cans, plastics, padding tubes and barrels as well as a number of special exhibits in the field of packing and shipping.

An advisory council is being organized to assist in developing definite plans for the conferences and clinics which will be held, as in the past, in conjunction with the Exposition. The members of the council will include leaders in the packaging, packing and shipping industries as well as a few important package users and distributors.

A partial list of exhibitors follows: Armstrong Cork and Insulation Company, Lancaster, Pa.; Associated Cooperate Industries of America, Inc., St. Louis; Charles Beck Machine Company, Philadelphia; Celluloid Corporation, New York; Cleveland Container Company, Cleveland; Container Corporation of America, Chicago; Continental Can Company, Inc., New York; Dexter Folder Company, New York; DuPont Cellophane Company, Inc., New York; J. L. Ferguson Company, Joliet, Ill.; Food Industries, New York; Hinde & Dauch Paper Company, Sandusky, Ohio; Jiffy Pad and Excelsior, Inc., New York; Kalamazoo Vegetable Parchment Company, Kalamazoo, Mich.; Kimberly-Clark Corporation, Chicago; Lowe Paper Company, Ridgefield, N. J.; National Adhesives Corporation, New York; National Metal Edge Box Company, Philadelphia; New England Collapsible Tube Company, New London, Conn.; Owens-Illinois Glass Company, Toledo; Package Machinery Company, Springfield, Mass.; Pioneer Paper Stock Company, Chicago; Reynolds Metals Company, New York; Riegel Paper Corporation, New York; Sefton National Fibre Can Company, St. Louis; Stokes & Smith Company, Philadelphia; Sylvania Industrial Corporation, New York; Triangle Package Machinery Company, Chicago; Wilson & Bennett Manufacturing Company, Chicago.

Deed Shows Mortgage to F. L. Carlisle & Co.

OSWEGO, N. Y., September 16, 1935—A deed filed this week with the county clerk shows a mortgage for $1,500,000 given by the Taggart-Oswego Paper and Bag Corporation to F. L. Carlisle & Co., in 1928. The mortgage tax amounted to $7,500 and half of this amount goes to the city and the remainder to the state. Briefs filed with the mortgage show that it was subsequently assigned to the Owego River Power Corporation, then to the Northeastern Power Company and later to the Niagara-Hudson Power Corporation. The mortgage covers the entire paper and bag plant of the local concern which is among the largest of several manufacturing and power developments launched by the Carlisle interests in recent years.

Boston Paper Industry Happenings

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., September 16, 1935—George D. Allen has resigned as treasurer of Knight, Allen & Clark, Inc. Mr. Allen first entered the paper business with the old firm of Pulsifer, Cook and Jordan in Boston. From that concern, he went to W. H. Claflin & Co., Inc., remaining with this company 25 years. He had been a member of the firm of Knight, Allen & Clark, Inc., sixteen years.

The first meeting of the season of the New England Paper Merchants Association is to be held at the Hotel Touraine September 19.

Charles J. O'Brien, of the sales staff of Baird & Bartlett Company, has returned from a week's vacation on Cape Cod.

William Foulds, Jr., president and secretary of William Foulds & Co., Inc., and vice-president of Lydall & Foulds Paper Company, Inc., both of Manchester, Conn., called on the trade and Malcolm B. Lowe, secretary-treasurer of the Lowe Paper Company, Ridgefield, N. J., renewed acquaintances here last week.

The New England Rag Commission Corporation, Holyoke, Mass., engaged in buying, selling and sorting rags and paper stock, filed a petition for reorganization September 11, in the Federal District Court, Boston, under Section 77-B, 1934 amendment to the National Bankruptcy Act. Liabilities are given as $22,787; assets, $21,501.

A. Thomson for Stream Purification

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, September 16, 1935—Alexander Thomson, president of the Champion Paper and Fibre Company, and head of the Ohio and Hamilton Chambers of Commerce, gave his support the past week to the movement now in progress to prevent pollution of streams, particularly in the Central States.

"Poisonous waste matters, which tend to cause disease among human persons, or to kill fish, should be disposed of in some other manner," he asserted.

"Streams in this country, however, are pure, compared to those in England," he continued "The mighty Thames is one of the foulest and filthiest streams I have ever seen or traveled upon. In England, anglers must go to Scotland to fish if they desire to follow the sport.

"England uses only about one-fourth of the water utilized in this country, on the per capita basis, and most of this is obtained from small mountrail rills and reservoirs where it has been impounded."

Downingtown Paper Co. Makes Improvements

[FROM OUR REGULAR CORRESPONDENT]

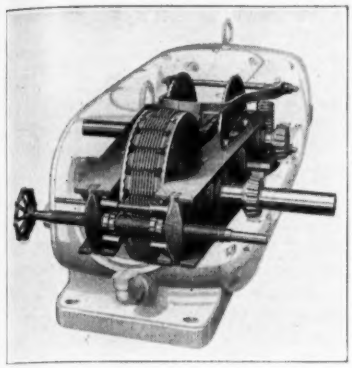
DOWNINGTOWN, Pa., September 16, 1935—Downingtown is going with its plans for expansion and a modern-looking addition is being erected to the south of the plant, which is located on Brandywine avenue, Downingtown.

Erection of the new two-story building, which was started a number of months ago, will probably cost in the neighborhood of $100,000, although no definite estimate has been made public by officials of the company.

No definite estimate of the cost of construction could be obtained in an interview with J. Gibson McIlvain, president of the company. He said: "We are trying to do what we have always done—give employment and keep our equipment up to standard. The new building is simply a replacement. We have had the unique record of employing our men for three hundred days and nights for the last twenty-five years, and we wish to continue that way."

Motorized Variable Speed Transmission Announced by Link-Belt

Announcement is made by Link-Belt Company, that in order to meet the growing demand for still greater range and flexibility of application, certain features of design have recently been incorporated in its P.I.V. Gear variable speed transmission, which will permit the entire line to be furnished in the following combinations and sizes:



(1) Motorized (when desired), with motor forming an integral part of the unit.
(2) With or without speed reduction gearing.
(3) With horizontal or vertical box.
(4) And in 5 sizes up to 15 hp. capacity.

Previously, P.I.V.'s were available in sizes up to but 10 hp., with horizontal box only, and without reduction gear sets or the integral motor feature. The motorized construction is said to make a very compact drive, eliminating the need of a separate motor base plate.

The operating principle of the basic unit remains the same as when introduced to American industry six years ago, at which time the unit was described as an innovation in variable speed transmission, since it was the first all-metal, automatically lubricated device which employed a specially designed side-contact chain operating between adjustable-diameter wheels with radially-cut teeth, for transmitting the power positively from input to output shaft.

A new Book No. 1574 has been prepared to cover the new combinations and capacity range of P.I.V. Gears available, and will be sent to any interested reader upon request addressed to Link-Belt Company, 2045 W. Hunting Park avenue, Philadelphia, or the nearest office of the company.

Indianapolis Interested in Prices

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., September 16, 1935—Satisfactory conditions seem to predominate in the local paper market. Demand for most lines is expanding and prices are being held firmly. With no more official holidays until early in the winter, the trade expects a regular run of business and looks for further expansion as cooler weather approaches. Even though prices are being held on an even keel, there is much private concern over the entire question. Most large buyers of paper are convinced there will be a break in prices and this feeling has had much to do with their buying. If anything could prove to them conclusively that prices are as low as they likely will get, volume would pick up immediately.

Demand for fine papers showed some progress during the week. The larger printers were taking more stock, their business having increased slightly. It is confidently expected that this fall will see a lot of direct mail advertising put over that was skipped during the spring season because of unfavorable weather conditions. Printers say they are now getting inquiries concerning calendars and Christmas specialties, prices naturally being the dominant feature. Books and covers also are moving nicely. The opening of the school season has done much this month to aid fine paper movement. Dealers, after the first rush of school buying, now are back in the market balancing their stocks.

Newsprint demand continues steady. Lineage continues to show some expansion and indications point to a good fall business. Among the larger papers the trend is particularly well developed. Both local and national advertisers are encouraging in their buying.

Box factories are fairly busy. There has been a slight increase in their business during the last two weeks, but some of them express dissatisfaction. The textile and automobile accessory businesses are buying, the former, however not as strong as has been the rule.

The paper stock trade also is a trifle improved. Lower grades in paper and rags are moving a little better than during the summer, but mill offering prices are not so encouraging.

Buffalo Waste Paper Co. Opens at Erie

ERIE, Pa., September 16, 1935—Adding another to the increasing number of larger industries which have moved to Erie and taken on an Erie personnel of employes and consequent pay envelopes is the Buffalo Company, Inc., which has opened an Erie branch in the old Germer Stove Company plant, 1511 German street.

The company, which has been in business since 1900, operates three other plants in Buffalo.

Forty employes are expected to handle the Erie operations, which include collection of baled waste paper from plants and firms in Erie and surrounding neighborhoods, its separation, sorting and repacking in the local plant, and shipment for paper mill consumption to all points of the country this side of Chicago.

Approximately 500 tons weekly will be handled here.

Six floors with an aggregate of 80,000 square feet comprise the Erie plant, whose interior has been completely remodeled during the past two months, with work now ready to begin upon the exterior and adjacent court.

Water Soluble Resin Abopon

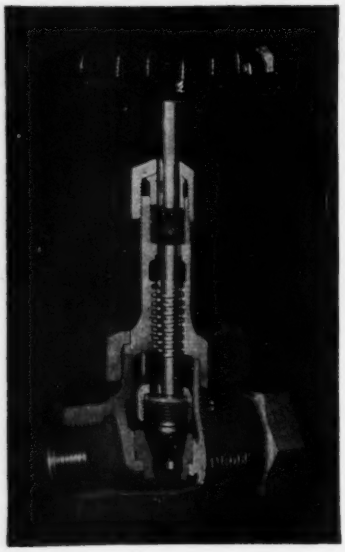
In the manufacture of water solutions of shellac and casein it has always been necessary to use an alkali to keep the shellac or casein dispersed. However, the Glyco Products Company, Inc., New York City, state that their recently developed water soluble "resin" Abopon will effectively displace alkalies in dissolving shellac and casein giving solutions which are free from alkali. Furthermore, solution can be effected at temperatures much lower than when alkalies are used. In the case of shellac, the shellac wax remains in dispersion and does not rise to the surface in the form of a scum as when alkalies are used. For coating and sizing purposes, for textiles, paper, leather and as a priming or sealing material in the paint, varnish and lacquer industries, Abopon has many interesting properties. Full information can be obtained from the manufacturer, The Glyco Products Co. Inc.

Brown Co. To Keep Running

GORHAM, N. H., September 16, 1935—The Brown Company paper mills expect to operate normally, subject to court order, until reorganization plans are under way. This reassurance was given to relieve the minds of hundreds of men who are employees of the company and make up two-thirds of the citizenry of Berlin and Gorham.

New Hancock Globe Valve

A new union bonnet bronze globe valve has been developed by the Hancock Valve Division of the Consolidated Ashcroft Hancock Company.



This new Hancock Valve has a number of advanced features which it is claimed greatly increase its wearing qualities. These advancements include superhard stainless steel valve discs and seat rings, (hardened to 500 Brinell), which are said to prevent wire drawing, steam cutting and galling.

The disc is attached to the stem in a new way that insures correct seating and facilitates regrinding.

Special types of bronze have been developed for the valve stem and bonnet which the makers claim greatly lengthen the service life of this valve.

A distinctive design provides tight back-seating and permits easy repacking while the valve is in pressure service. Made for steam pressures up to 300 pounds, these new bronze valves are available in both globe and angle patterns.

The many other features of design and materials are fully described in a new bulletin which may be obtained by writing the Hancock Valve Company, 87 Elias street, Bridgeport, Conn.

Board Men Favor Packaged Liquor

H. S. Adler, secretary of the National Paperboard Association, 80 East Jackson Boulevard, Chicago, has just sent the following letter to members:

"As you are, of course, aware, Congress just before adjournment enacted the Federal Alcohol Control Bill which continues to require the sale of Liquor in packages, and which does not permit bulk sales as advocated by the cooperage interests.

"This subject was reported upon and discussed in detail at a well-attended meeting of the Western Division of the National Paperboard Association, held in Chicago, August 29, 1935. It was the sense of the meeting that this subject, which is of great importance to the Paperboard Industry and the manufacturers of paperboard boxes and cartons, should receive continuous attention, inasmuch as the cooperage interests will undoubtedly renew their drive before and during the next session of Congress with a view to having the recently enacted law amended to permit bulk sales.

"Instructions were issued that this subject again be called to the attention of members of the Paperboard Industry so that they may bring home to their Senators and Representatives the importance of this matter to the Paperboard Industry and its employees. Reasons which may be advanced for a continuation of the present provision, which calls for packaged liquor, are repeated below:

"1. Bulk sales of liquor will reduce the consumption of paperboard thus seriously affecting employment in localities where your mills are located. Probably 100,000 employees in the paperboard and converting industries are vitally interested in a continuation of "packaged" liquor.

"2. Members of this industry purchase direct from farmers thousands of tons of straw, an otherwise waste product, and if present provisions are changed to reduce the use of paperboard packages for liquor, the purchase of straw from farmers will be proportionately curtailed.

"3. Assuming the sentiment of your community is against bulk sales, with attendant bootlegging, get before your Senators the feeling of your community.

"In this connection, we are sending you herewith a memorandum giving a record of the vote on this bill in the Senate on August 13, 1935. Please note that 24 Senators voted for "Bulk" sales. It is particularly suggested that any members operating plants and paying taxes in the States represented by these 24 Senators make a special effort, through their employees and otherwise, to have these Senators realize the importance of this subject to the Paperboard Industry and its employees."

W. S. Hewins Made Asst. Secretary

William S. Hewins has joined the staff of the National Paper Trade as an assistant secretary. He will be very largely engaged in field work. Mr. Hewins will continue his residence at Ashtabula, Ohio. In announcing the appointment A. H. Chamberlain, secretary of the National Paper Trade Association says:

"The acquisition of Mr. Hewins is very gratifying and encouraging to your officers and National staff. For best results in organized local work, educational service and membership promotion, the National Association requires more field work than the present staff has been able to do. His employment represents an important step in carrying out the program of our Executive Committee as outlined to you in the report of their last meeting. To obtain a thoroughly qualified man has been a difficult job precluding hasty action but we feel that our deliberate procedure has been justified by our success.

"Mr. Hewins has been a member of the Association for some years and enjoys the friendship and confidence of many Paper merchants and manufacturers. He has attended our Conventions and is familiar with all our activities, having served as President of the Tri-State Association. He has an impressive personality, is a ready and convincing speaker and has been recognized as a leading citizen of his city in the presidency of the Chamber of Commerce and the Rotary Club, as well as in other public service. We believe his attendance at Local meetings and his visits with members in the trade in different markets will be exceedingly stimulating and helpful. We bespeak for him a cordial reception and hearty cooperation from all our members."

Estate of Edwin S. Reynolds

DAYTON, Ohio, September 16, 1935—The estate of the late Edwin S. Reynolds, president of the Reynolds & Reynolds Company, Dayton, manufacturers of business systems and other paper products, is valued at $316,490.39, according to the inventory and appraisement filed in the Probate court here the past week.

Of this amount, $314,630.39 is in bonds and other securities. The inventory shows that Reynolds owned 3,050 and one-tenth shares of common Class "A" stock in the Reynolds & Reynolds Company, on which a value of $305,010 is placed.

Boston Paper Market Fairly Active

[FROM OUR REGULAR CORRESPONDENT]

BOSTON, Mass., September 16, 1935—Sales in the Boston paper market last week were in fairly good volume, although it is estimated that there was not quite so much activity as during the previous week. The trade, by and large, continued cheerful. Comments in the fine paper division included "not quite so good," "fair," and "a little better." The situation in the wrapping division was at least fair, with the outlook appearing good. The price position of paper bags acquired greater stability, at least for manufacturers, with the general feeling better. Paper specialties moved in a volume hardly better than fair. There is a little more activity in box board, although the demand for material for shoe cartons was less.

The strength of paper stock was sustained, with considerable activity in a number of grades. In old papers, there was a very active business in mixed papers, old newspapers and corrugated boxes, all of which remained firm at the same levels. White blank news moved well, the price appreciating to 1.25 @ 1.30 from 1.15 @ 1.20. Print manila also moved in substantial quantities, the value rising to .50 @ .60 from .40 @ .45. Bagging and new domestic rags continued strong at the same quotations. Under old domestic rags, roofing stock maintained a well intrenched position, with an advancing tendency. The No. 2 grade advanced to 1.25 @ 1.30 from 1.15 @ 1.20 and the No. 3 grade to 1.05 @ 1.10 from .95 @ 1.05. In foreign rags, dark cottons were very active, continuing to advance in price, selling at 1.60 @ 1.70, compared with 1.55 @ 1.65 the previous week and 1.50 @ 1.55 the week before that.

Z. W. Ranck Returns from Europe

DAYTON, Ohio, September 16, 1935—Z. W. Ranck, president of the Crystal Tissue Company, Middletown, with his wife and family, returned the past week from a tour of the European country. The tour was of six months' duration and covered the greater part of the country.

He spoke at a dinner meeting of the Middletown Rotary club on Tuesday, and detailed his experiences. While Mr. Ranck knew little concerning the matter at the time it took place, he learned his family had been robbed of $800 while traveling on a train from Moscow to Gorky, a 274-mile trip.

When members of the family notified soldiers who accompanied the train that their compartment had been entered and ransacked, the soldiers merely laughed, Mr. Ranck was advised, while no attempt was made to apprehend the guilty parties.

France To Develop Paper Industry

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 17, 1935.—A movement for the greater development of the French paper industry is under way at the present time, according to a recent report from Assistant Trade Commissioner Joseph G. Stovall, Paris. Interests particularly concerned in the development of a domestic pulp industry have recently published a number of articles stating that France is capable of producing a much larger proportion of the raw products used in paper making than it does at present. A recent statement credited to the Chief of the Eaux et Forests Division of the Ministry of Agriculture declares that although France is the third largest producer of paper in Europe only a small percentage of the mills making paper now produce their own pulp and that 90 per cent of the raw products consumed in the mills is imported.

Ideal Commutator Catalogue

One of the most complete and comprehensive catalogue-data books issued this year is the new 64-page publication now being distributed by the Ideal Commutator Dresser Company, Sycamore, Ill.

In accordance with the usual policy of this company, not only does this new book list the entire Ideal Line, including many new and improved products now being manufactured, but the catalog contains much up-to-the-minute information on the care and servicing of commutators and slip rings, and general electrical maintenance, all of which will be of great value to electrical men.

The detailed information on commutator care, troubles and remedies and the data on operation of direct current generators has been compiled and edited by engineers of national prominence, who have had practical experience, and know the problems confronting the maintenance man. Other useful material found in this book is: Definitions of Electrical Terms; Tables on Current Carrying Capacities of Solid and Stranded Wires; Fusing, Wiring and Full Load Current Data for all types of motors; Formula for Determining Amperes, Horsepower, Kilowatts and Kilovolt-amperes; Tables for Calculating Electric Current, etc.

Of the many new products listed in this completely revised reference book are the new and improved polishing-grade Commutator Resurfacer and a new type Resurfacer for reconditioning cast iron and steel slip rings.

The Ideal Line of Precision Grinders has been added to and besides, made more adaptable by many new bracket supports. Among many other new products are found a complete line of electric cleaners, the Tel-Temp, a new and practical industrial thermometer, an improved Coil Winding Head and new sizes of Ideal "thread-on" type Solderless Wire Connectors and Lugs.

Copies of this revised catalogue and reference book may be had by writing to this publication or direct to the Ideal Commutator Dresser Company, Sycamore, Ill.

Improved Alum Treatment of Stock Board

Anyone interested may have a copy of a new bulletin which has just been issued on Micromax automatic pH control for "Improved Alum Treatment of Board Stock."

This 12-page booklet shows how some mills are improving color uniformity of board, adding to its color-printing quality, saving excess alum and decreasing corrosion of equipment—all by means of a fully automatic control which holds pH stock delivered to the vat constant within +0.1 pH.

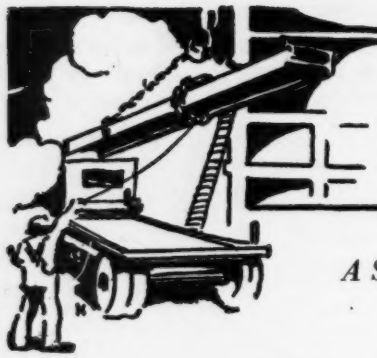
Board manufacturers will be interested in the rugged machine-like equipment, in its close control of stock, in the permanent chart record which serves as a guide when running a sheet again.

This booklet may be had by asking Leeds & Northrup Company, 4934 Stenton avenue, Philadelphia, Pa., for Bulletin 709-A.

Resigns as President of Ryther & Pringle Co.

[FROM OUR REGULAR CORRESPONDENT]

CARTHAGE, N. Y., September 16, 1935—Dell W. Sarvay has resigned as president and director of Ryther & Pringle Company after serving in that capacity since the death of the late George D. Ryder, a few years ago. The resignation became effective this week and announcement was made at the same time that he would continue with the company in a managerial capacity. He became connected with the company in 1926 following the death of George Gilbert and was promoted to the presidency in 1930.



CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Buffalo, N. Y.—The Buffalo Envelope Company, 270 Michigan avenue, manufacturer of commercial paper products, has plans for new addition to paper converting plant, comprising a three-story and basement unit, 60 x 100 feet, estimated to cost over $50,000, including equipment. Large increased capacity will be carried out. Bids are being asked on general building contract. Albert H. Hopkins, Liberty Bank Building, is architect.

Franklin, Ohio—The Franklin Board and Paper Company, manufacturer of pulp board, manila and other paper stocks, is completing plans for extensions and improvements in boiler plant at local mill, to include installation of new equipment. Proposed to proceed with work at early date. Estimated cost has not been announced. H. Collins Wight, Union Trust Building, Dayton, Ohio, is consulting engineer.

Vincennes, Ind.—The Pomeroy Manufacturing Company has been organized with capital of $100,000, to manufacture corrugated and paper boxes and containers, and allied paper specialties. New organization will take over company of same name, with local plant at 408 East St. Clair street. It is headed by Harry Pomeroy, Fred G. Kimball and Roy Hudson.

Emeryville, Cal.—The Paraffine Companies, Inc., 475 Brannan street, San Francisco, Cal., manufacturer of building papers and other paper products, has approved plans for new addition to mill at Emeryville, to be one-story, reported to cost over $75,000, including equipment. Contract for structural steel framing has been awarded to the Moore Dry Dock Company, foot of Adeline street, Oakland, Cal., and superstructure will be placed under way at early date.

Lockland, Ohio—The Gardner-Richardson Company, Wyoming and Cooper streets, manufacturer of paperboard, chipboard and allied paper products, has plans for extensions and improvements in power house at mill, including installation of new equipment. Contract for new boiler unit, designed to deliver 130 pounds of steam per hour, has been let to the Combustion Engineering Company, 200 Madison avenue, New York, N. Y.; an award for stoker has been placed with the American Engineering Company, Aramingo and Cumberland streets, Philadelphia. Awards for auxiliary equipment will be made at early date. Expansion is estimated to cost over $100,000, with equipment. Company engineering department is in charge.

Camden, Ark.—Bagpak, Inc., 220 East 42nd street, New York, N. Y., specializing in the manufacture of heavy paper bags for cement, plaster and allied products, has plans under way for construction of new mill at Camden, where site has been selected in the vicinity of the plant of the George & Sherrard Paper Company. New mill will be one-story, 110 x 300 feet, with several smaller adjoining units. It is understood that a one-story power house will also be constructed. Plant will be equipped for large capacity and is estimated to cost close to $100,000, including machinery. Superstructure will be placed under way at early date. Paper stock will be secured from the Camden mill of the Southern Kraft Corporation, a subsidiary of the International Paper Company, 220 East Forty-second street, New York, with which Bagpak, Inc., is closely associated.

Wausau, Wis.—The Minnesota Mining and Manufacturing Company, 791 Forest street, St. Paul, Minn., manufacturer of abrasive papers, sandpapers, etc., has work nearing completion on new addition to raw material plant at Wausau, previously referred to in these columns. It will be one-story, 75 x 200 feet, used largely for storage and distributing service, estimated to cost about $40,000, including equipment. William M. Murphy & Son, New York Building, St. Paul, are general building contractors. John Haas is manager at the plant.

Corning, N. Y.—The Corning Fibre Box Corporation, manufacturer of boxes, containers, etc., will soon begin installation of a sprinkler system in connection with completion of new one-story building, to be used for storage and distributing service. Structure will be ready for service at early date and provide considerable increase in present facilities. It will represent a reported investment of about $25,000.

Wilmington, Ill.—Fire recently damaged a portion of mill of Orenda Corporation, manufacturer of combination paperboard products, chipboard, etc. An official estimate of loss has not been announced. The damage will be replaced.

Cambridge, Mass.—I. G. Emerson, Cambridge, has concluded negotiations for the purchase of the former plant of the Climax Paper Box Company, North Cambridge, manufacturer of paper boxes and containers, and will use for another branch of manufacture. The property has been held recently by the Boston Safe Deposit & Trust Company, Boston, Mass., as trustee, and was valued at $25,000.

Minneapolis, Minn.—The Winona Box Manufacturing Company, manufacturer of paper boxes and containers, has taken over a local building at East Hennepin avenue and Sixteenth street, and will remodel and equip for new plant. New machinery will be installed for large production. It is expected to have the plant ready for service in 30 to 60 days. Charles Shapero is president.

Squamish, B. C.—J. P. Meehan & Co., Ltd., 207 West Hastings street, Vancouver, B. C., have plans under way for a new pulp and paper mill on site at Squamish. It will comprise several one and multi-story units, with power house, pumping station and other mechanical departments, estimated to cost close to $300,000, with equipment.

Mexico, D. F.—The new paper-manufacturing and importing company to be organized and controlled by the

Mexican Government, under direction of the Bureau of National Economy, Mexico, recently referred to in these columns, will be known as the Sociedad Productora e Importadora de Papel, S. A. (Paper Producing & Importing Society, Inc.). The Government will make a subscription of about 500,000 pesos (approximately $140,000) for a majority of the stock of the new company, which, as previously reported, plans construction of new paper mill and development of storage and distribution facilities for paper importations. A Considerable part of immediate activities will be given over to newsprint.

New Companies

Tallahasse, Fla.—The North Florida Paper Company, Inc., has been organized to manufacture and deal in paper products of various kinds. The new company is headed by F. B. and B. W. Beckton, both of Tallahasse.

Chelsea, Mass.—The Empire Paper Products Company has been chartered with capital of 2,000 shares of stock, no par value, to deal in paper goods of various kinds. M. E. Costello is president; Betty S. Neiman, Brookline, Mass., is treasurer and representative.

Indianapolis, Ind.—The Advance Paper Stock Company, Inc., 318 West Georgia street, has been incorporated with capital of 1,000 shares of stock, no par value, to deal in paper goods of different kinds. The incorporators include Enos D. Pray, 2174 North Meridian street, Indianapolis, and Jacob L. Steinmetz.

New York, N. Y.—Moulded Displays, Inc., has been incorporated with capital of 100 shares of stock, no par value, to manufacture and deal in pulp products. The incorporators include Clarence E. Nelson, Old Greenwich, Conn.; Roy Sheldon, 865 First avenue, and Wilton D. Cole, 111 Eighth avenue, both New York.

New York, N. Y.—Acer, Walsh & Co., Inc., has been chartered with capital of $201,000, to manufacture and deal in paper products of various kinds. The principal incorporators are John H. A. Acer, Canada Cement Building, Montreal, Que., president of the Dryden Paper Company, Ltd., Dryden, Ont.; James F. Walsh, 10 East Fortieth street, New York; and Colemar F. Nichols, 115 Broadway, New York.

Greenville, Tex.—The Bland Folding Book Cover Company has been incorporated to manufacture special paper goods, particularly for commercial service. New company is headed by James F. Bland and Forrest K. Lake, both of Greenville.

New York, N. Y.—The Brenner Paper Manufacturing, Inc., 26 West Seventeenth street, has filed notice of change of company name to the Brenner Paper Products.

Cleveland, Ohio—The Adler-Friedl Paper Company has been incorporated with capital of 250 shares of stock, no par value, to deal in paper products of various kinds. The incorporators include Joseph Friedl and Frank Zoren. Company is represented by Brooker, Weltman & Brooker, 1426 Standard Building, Cleveland, attorneys.

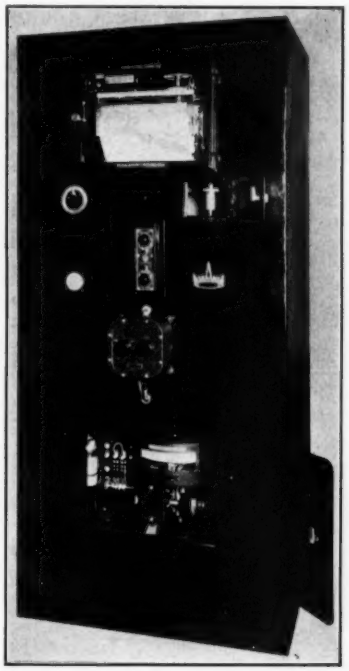
Vegetable Parchment Exports Lower

Exports of vegetable parchment from Belgium during the first six months of this year were about 10 metric tons short of shipments during the corresponding period of last year according to unofficial reports received by the Department of Commerce.

Shipments of vegetable parchment totaling 1,830 metric tons were made during the first six months. Exports of coated papers dropped from 232 metric tons during the first half of 1934 to 146 tons during the corresponding period of this year.

Humidity Control for Paper Machines

The automatic control of paper humidity has been one of the most difficult control problems of the paper industry. The reason for this is that a great number of factors determine the humidity of the paper and that with present day high speed paper machines the control has to be extremely fast in operation and yet must not overregulate in spite of the rather high time lag usually encountered in even medium size machines.



The American Askania Corporation, in close co-operation with paper engineers, has developed a control system which has been successfully employed in almost one hundred installations throughout the world, and which is now marketed by this company in the United States.

The control operates on a new indirect method of determining the paper humidity and has the advantage of being extremely simple and instantaneous in response. In most installations the moisture content of the paper has been maintained within two tenths of one per cent. An additional advantage is the great improvement in the uniformity of the product and less paper breaks. The instrument, which is mounted on a panel board as shown in the photograph can easily be set by the machine tender for different grades of paper and records the complete operating process of the machine, giving a continuous record of the paper humidity, indicating interruptions of the drying process due to paper breaks or other time losses.

Paper Concerns Report Business Good

ALBANY, N. Y., September 16, 1935—Several concerns in this section producing paper mill products report business exceptionally good. An official of the Eastern Tablet Company declared that his concern was sold up to October and that business during last month was 25 per cent better than last year. In July business ran 60 per cent ahead of last year and in June 90 per cent. The company normally employs 225 persons but today finds nearly 300 at work with some departments running several shifts in order to meet the demand for school pads and tablets. The concern usually does its best business in the spring but this year a rush of orders developed during the usual dull period.

The mills of F. C. Huyck & Son, Rensselaer, are also running full time and have been for some time. The company reports business good and that the improvement appears permanent. Since the first of the year the company has enlarged its working force with capacity operations in effect. The passing of the NRA has made little difference to the mills for the NRA code wages and hour scales are being continued. The company does not believe that the elimination of the NRA has stimulated business.

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CANADIAN NEWSPRINT EXPORTS

Exports to countries other than the United States are becoming a matter of increasing importance to the Canadian newsprint industry according to the Royal Bank of Canada. Whereas such exports took care of six per cent of Canadian production in 1927, they amounted to eighteen per cent of the increased production of 1934. In the interval between 1932 and 1934 there was a major recovery in the volume of newsprint production. Where Canadian production had fallen to 1,914,000 tons in 1932, by 1934 it had reached 2,599,000 tons. Of this increase, one-third was sold in overseas markets. If this expansion in new markets were merely an outlet for some of Canada's surplus capacity during the depression, it would be regarded as a welcome relief, but as of temporary importance. In point of fact, however, the careful study of the situation found in "Newsprint in the World Market," a pamphlet by Mr. R. K. Martin, Secretary of the Newsprint Export Association, suggests the probability of a steadily increasing overseas demand for Canadian newsprint.

Scandinavian output of newsprint seems to be approaching the maximum which can be economically produced in that area. A like report has been made concerning Newfoundland. While it is said that the United States could greatly increase production by developing mills in Oregon or Alaska or by a new process, making use of the pines in the south, such developments would involve large investments, which seem improbable unless newsprint prices rule much higher than in recent years. It is possible that there may be an increase in the amount available from Russia, but in that country there has been a steady increase in home demand and it may even prove difficult for Russia to keep abreast of her own requirements. In these circumstances a study of the trend of consumption in foreign markets must be of peculiar interest to Canada.

Between 1927 and 1934 newsprint consumption in Great Britain increased from 844,000 to 1,291,000 tons; that in France from 235,000 to 400,000 tons; that in Russia from 85,000 to 183,000 tons, and total overseas consumption showed an increase of more than 1,300,000 tons.

Canada, with forty per cent of the world's newsprint capacity, producing two-thirds of the newsprint which enters into international trade and with an excess capacity as compared with 1934 production greater than that of the whole of the rest of the world, has been the chief sufferer from under-consumption and low prices. With the trend toward recovery well established, and with indications that newsprint consumption is likely to show a large per capita increase in many overseas markets, Canada stands to receive the chief benefits from such improvement in world demand.

In 1927, per capita newsprint consumption in the United States amounted to 58 pounds; at the peak in 1929 it was 62 pounds. In 1927 per capita consumption in the United Kingdom was 37.5 pounds and that in Australia and New Zealand was 43.5 pounds. There was no other overseas market in which consumption had reached one-third of the per capita figure in the United Kingdom. At that time there was a general assumption that the per capita consumption in the United States was so high as to be unattainable in any other country. In 1934, however, British consumption reached 57.5 pounds per capita; that in the United States was 48 pounds, and that in Australia and New Zealand was 43.9. In this seven-year interval, per capita consumption in Argentina more than doubled, increasing by 13.9 pounds, and that in France and Holland increased by more than 7 pounds, while consumption in Japan and Scandinavia increased by more than 4 pounds per capita. In the countries mentioned in the last sentence, the gain in total volume consumed has amouted to more than 75 per cent. The gains in Argentina, France, Japan, Holland and Scandinavia have amounted to 489,000 tons; the gains in the United Kingdom to 447,000, and the gains in other overseas markets to 381,000 tons. The United States consumption in 1934 was 314,000 tons less than in 1927. In spite of gains, the per capita consumption in most overseas areas is still at a low level, leaving a wide margin for expansion as the populations of various countries begin to take a wider interest in news and advertisers begin to utilize this approach to their public on a more adequate scale.

AUGUST NEWSPRINT STATISTICS

Production of newsprint in Canada during August 1935 amounted to 235,573 tons and shipments to 225,736 tons, according to the News Print-Service Bureau. Production in the United States was 75,187 tons and shipments 74,872 tons, making a total United States and Canadian news print production of 310,760 tons and shipments of 300,608 tons. During August 29,565 tons of news print were made in Newfoundland and 2,069 tons in Mexico, so that the total North American production for the month amounted to 342,394 tons. Total production in August 1934 was 329,159 tons.

The Canadian mills produced 67,534 tons more in the

first eight months of 1935 than in the first eight months of 1934, which was an increase of 4 percent. The output in the United States was 38,104 tons or 6 percent less than for the first eight months of 1934, in Newfoundland 11,571 tons or 5 percent more, and in Mexico 873 tons more, making a total increase of 41,838 tons, or one and six-tenths percent.

Stocks of news print paper at Canadian mills were reported at 75,305 tons at the end of August and at United States mills 18,202 tons, making a combined total of 93,507 tons compared with 83,355 tons on July 31, 1935.

Analysis of Anti-Dumping Act

In view of the agitation of a group of American industries for a new Anti-Dumping Act, and the consequent introduction of the so-called Harter Bill, H. R., 8603, the Import Committee of the American Paper Industry has issued a special report giving an analysis of the existing Anti-Dumping Act, the Anti-Dumping laws of other nations, and the Paper Industry's experience under the existing Act. The report shows that in ten years the Import Committee has filed thirty-three complaints of dumping of various papers, and that in only one instance has a dumping ruling been issued by the Treasury Department. The complaints have usually been dismissed on the ground that the American industry did not prove injury by the dumping of the foreign papers. Under the proposed bill, injury is assumed to be automatically suffered if foreign merchandise is sold at prices less than the usual prices in the country of origin.

Glassine from Austria being sold duty paid at about 10½ cents per pound, appears on Customs import statistics as valued at nearly 13 cents per pound, foreign mill value, and duty is being paid on this value. The situation is so evidently questionable that the Import Committee of the American Paper Industry has asked for Government investigation on the ground of dumping.

Envelopes of decorated writing paper have been held dutiable at a rate 5 percent higher than that claimed by the importer.

Red spinning vegetable parchment imported in strips one inch wide will henceforth be classified for duty, not as material, at 2 cents per pound and 10 percent, the rate for vegetable parchment, but as articles made of such parchment at 5 cents per pound and 20 percent.

The Treasury Department has reaffirmed its ruling that all pulpboard in sheets must be marked with the country of origin. In administering this provision, Customs officials will consider pulp board to be a board made entirely or of approximately 90 percent mechanical wood pulp.

Finnish M. G. Kraft Wrapping Paper is found to be sold for export at less than the home market price, and duty is now being levied on a basis of about 10 percent higher than the actual export sale price.

Desist Order Against Kraft Paper Mills

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., September 16, 1935—Kraft Paper Mills, Inc., has agreed to a cease and desist order with the Federal Trade Commission from using the word "mills" in its trade name or in other ways which may have a tendency to deceive buyers into believing that the corporation owns, operates and controls a mill or factory wherein the products which it sells and distributes are made, when this is not true.

Weekly Production Ratio Report

Reports to the American Paper and Pulp Association show the following Over-All Production Ratios for the designated periods.

	Reporting Mills		Total Production
	Number	Capacity	Ratio
September, 1934	292–299	.....	59.4%
October, 1934	297–394	.....	64.7%
November, 1934	385–399	.....	61.7%
December, 1934 (a)	396–404	.....	62.1%
January, 1935	397–411	.....	65.8%
February, 1935	407–409	.....	70.0%
March, 1935	406–408	.....	70.5%
April, 1935	405–407	.....	70.0%
May, 1935	379–407	.....	69.4%
June, 1935	356–375	.....	72.2%
July, 1935 (b)	356–357	.....	67.8%
*Week ending August 3, 1935	351	146,895	70.7%
*Week ending August 10, 1935	350	144,704	69.6%
*Week ending August 17, 1935	349	146,372	70.7%
*Week ending August 24, 1935	344	143,983	70.4%
*Week ending August 31, 1935	334	138,240	71.9%
*Week ending September 7, 1935 (c)	260	85,815	74.3%

Statistics showing the number of mills reporting by ratio groups are given below:

	Number of Mills Reporting					
	Week ending					
Ratio Limits	Aug. 3, 1935	Aug. 10, 1935	Aug. 17, 1935	Aug. 24, 1935	Aug. 31, 1935	Sept. 7, 1935
0% to 50%	132	115	115	112	111	77
51% to 100%	219	235	234	232	223	183

* Subject to revision.

According to reports from the National Paperboard Association per cents of operation, based on "Inch-Hours" were as follows:

	September, 1934	62 per cent		June, 1935	65 per cent
	October, 1934	63 per cent		July, 1935	59 per cent
	November, 1934	56 per cent			
(a)	December, 1934	53 per cent	August	3, 1935	66 per cent
	January, 1935	61 per cent	August	10, 1935	64 per cent
	February, 1935	67 per cent	August	17, 1935	65 per cent
	March, 1935	67 per cent	August	24, 1935	67 per cent
	April, 1935	61 per cent	August	31, 1935	69 per cent
	May, 1935	61 per cent	September	7, 1935	61 per cent

(a) Capacity and percentage data exclude December 25, 1934.
(b) Capacity and percentage data exclude July 4, 1935.
(c) Capacity and percentage data exclude September 2, 1935.

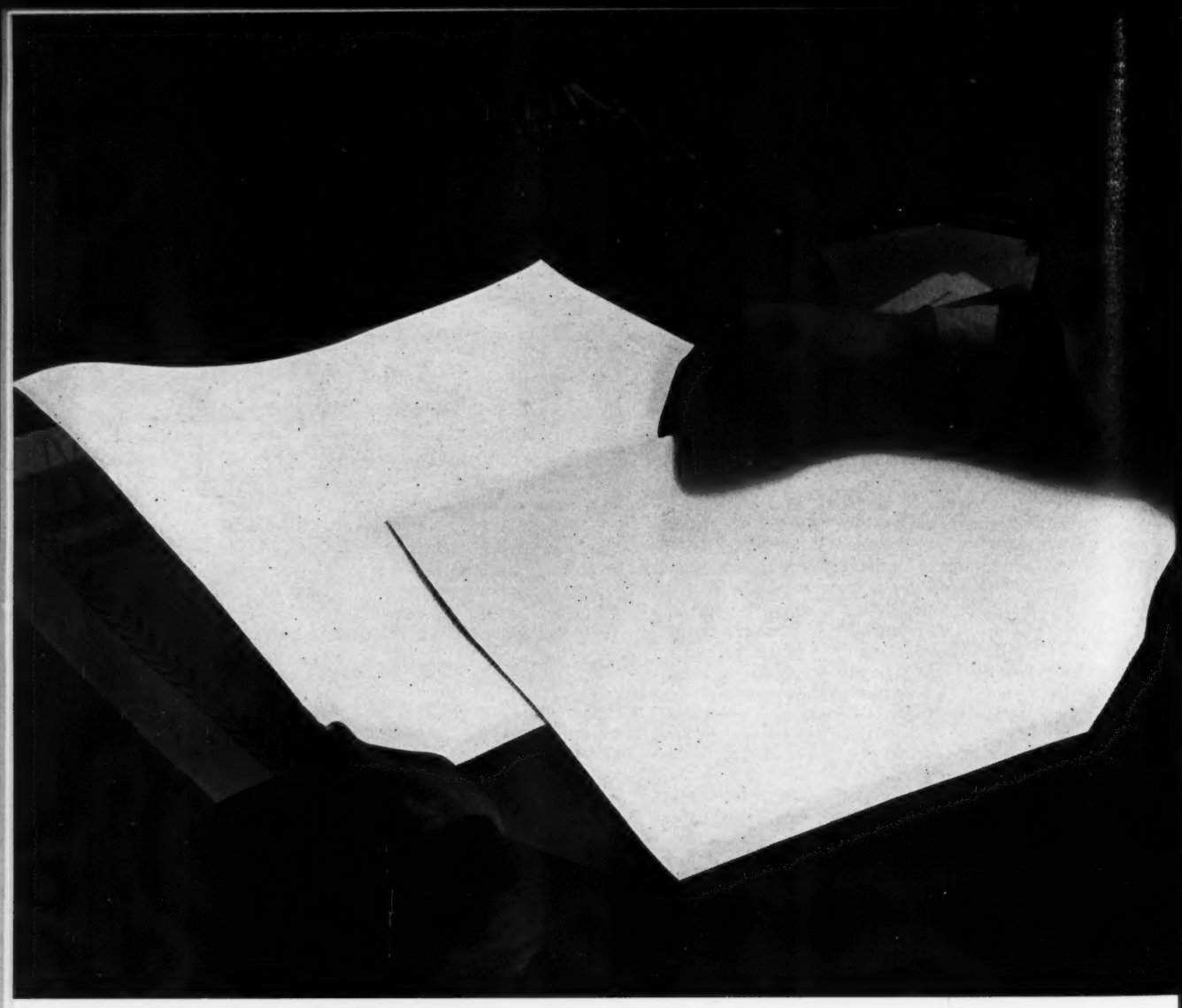
Revised statistics covering delinquent mill returns will be shown in later reports.

Plans for National Paper Trade Meeting

At the Semi-Annual Convention of The National Paper Trade Association to be held at the Stevens Hotel, Chicago September 23-26, the opening session scheduled for Tuesday morning, September 24, will be similar to the first session of the Convention held last February in New York City. Representatives of the leading manufacturing groups have been invited to speak briefly as to the conditions and outlook in their branch of the industry.

There will also be an address by Bennett Chapple on the public relations of business and general sales promotion, a subject on which he is recognized as an authority. Mr. Chapple has been in charge of The American Rolling Mill Company's publicity and promotional forces for the past twenty years. Since 1928 he has been vice president in charge of public relations, in addition to his other activities. He is past president of the National Industrial Advertisers' Association, and has served on the board of directors of both the Advertising Federation of America and the Association of National Advertisers. His talk on public relations, general sales promotion, and the broad field of advertising as it applies to the Paper industry, should be exceedingly entertaining, informative and stimulating.

Manufacturers and mill representatives are cordially invited to attend this meeting, as are all members of the Paper Trade, whether members of the Association or not.



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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

The Testing of Newsprint with Respect to Printing Quality*

By Herbert H. Grantham[1] and William Ure[2]

Abstract

Comparative tests on newsprint have been made by the castor oil flotation method, oil penetration methods, and an oil drop absorption method which has been developed during this work. The first two are believed to measure the same thing—the penetration of the liquid through the sheet when there is excess of that liquid on one side of the paper. The castor oil flotation test does not indicate variations in calendering and gives contradictory evidence when applied to changes in composition.

The oil drop absorption test shows promise as a means of predicting the printing behavior of newsprint. The test is very sensitive to variations in calendering and to changes in composition of the sheet, when comparable samples are examined.

The results obtained with newsprint in the printing room may be said in general to depend upon two main factors, namely the paper and the ink. In this study attention will be confined to the former.

There are a number of factors pertaining to the paper itself which exert an influence on the behavior which may be expected in the press-room. These include smoothness, opacity, porosity, volumetric composition, fiber composition, and oil absorbency. Since it was decided to limit the investigation in this case to an attempt to obtain further information about the surface available for absorption of ink oil, consideration will be given to certain of the variables in the manufacture of newsprint which appear to determine this surface. These are composition, that is the percentage of ground wood and sulphite, and calendering. The necessity for obtaining further information along these lines is made evident when the possible defects which may occur on printing are considered. The principal causes of complaint are "strike-through," "show-through," and "offset." The first named is occasioned by penetration of the ink-oil through the sheet, causing a stain on the reverse side. There appears to be some ambiguity in connection with the second, but it would seem, according to H. Andrews, *(1)* to refer to the showing through of the print from the reverse side when the paper is held up to the light, due to the difference in light reflected from the printed and unprinted portions; also, it seems to be affected, in part at least, by the fact that the fibers are wet with oil. "Offset" is the smudging of the print from one sheet to another, due to tardy drying, and is obviously also related to the absorption of the ink oil by the paper. It is then imperative that the paper manufacturer have some ready means of predicting, as far as his product is concerned, its behavior in the printing room.

The mechanism of the process in which news ink dries by the absorption of the mineral oil does not seem to be properly understood. News ink consists of finely divided particles of carbon black suspended in oil, with or without the addition of a toner. The effect of the latter upon drying is small. The whole question of drying is then one of absorption of the oil by the paper. It has been shown by DeWaele *(2)* that the rate of drying is an inverse function of the square root of the viscosity. The rate of absorption of ink oils has been discussed by W. B. Campbell *(3)* who says that the most important factors seem to be: (1) Ease of wetting of paper by oil, (2) resiliency or "spring-back" after compression, (3) size of capillaries in the paper, (4) void fraction of paper volume, (5) surface tension of ink oil, (6) viscosity of ink oil. During the years 1928-33, an investigation of newsprint and news ink was carried on at the Government Printing Office, Washington, D. C. The authors of the published report have little to say of the nature of the absorptive process, but do speak of an "initial absorption or tendency of the paper to draw the oil from the ink into the body of the sheet and to carry it through the sheet," followed by "another more leisurely penetration which occurs later." The authors further make the statement that "Some evidence has been obtained which indicates that in such papers the oil travels into the paper by being absorbed by the fibers themselves as well as by travelling through the spaces between the fibers." *(4)*

Andrews *(1)* has suggested that the oil spreads over the free surface of the fibers as a film; that there is no flooding of the pores as there is insufficient oil for that purpose. The question of absorption of a given oil by paper is then a question of the available surface. The possibility of actual measurement of this surface was considered but it was decided to approach the problem by more direct methods. A search of the literature pertaining to sizing tests, penetration tests and absorption tests provided a

* Presented before the Industrial and Engineering Section, Canadian Chemists' Convention, Kingston, Ontario, June, 1935.
[1] University of British Columbia.
[2] Asst. Professor of Chemistry, Univ. of British Columbia.

mass of contradictory evidence. The tests which might be expected to give information as to printing quality may be classified as follows: (1) Direct tests, (2) Penetration tests and (3) Absorption tests.

(1) Direct Tests

Under this heading may be mentioned a number of tests involving the drawing of lines or characters on the paper followed by observation of the spreading on the surface or penetration through the sheet. These are summarized by Carson *(5)* who points out, "that observing the behavior of ink lines on the surface of paper is the most rational procedure for testing writing quality." While these are on the whole very subjective and present obvious difficulties in technique, it would seem that one such as that proposed by Graff *(6)* might well be used in conjunction with an absorption test. In the Graff Test the width of an ink line is measured while wet and again when dry, measuring the percentage increase by means of a micrometer scale.

(2) Penetration Tests

A great many tests have been devised which involve the penetration of some liquid through paper. These also are described by Carson *(5)* in his summary of sizing tests. Although these are intended to be measures of degree of sizing, and newsprint is either unsized or only slightly sized, yet the penetration of a liquid through a sheet of newsprint undoubtedly gives us some information about that sheet. Whether, however, it tells us anything about printing quality or whether it is merely another method of measuring the porosity of the sheet is a moot point. In general these tests are alike insofar as they consist of measuring the time required for a liquid introduced in some way to one surface of the sheet, to make its way through to the other side. The means of determining the end point constitutes the principal variation between these tests. Recent forms of commercial apparatus designed to increase the accuracy of reading and to render the test less subjective are the Williams Penetration Tester *(7)* and the Penescope, invented by Abrams. *(8)* This type of test, in its simplest form a modification of the original Klemm flotation test, *(5)* is the widely used ink flotation or castor-oil flotation test. This consists in floating two inch squares of the paper on castor oil and taking the time necessary for complete saturation, and was employed as a standard method in the recently concluded investigation on "Newsprint and News Ink" carried on at the Government Printing Office, Washington, D. C. *(9)* Castor oil is selected as the liquid medium rather than ink or ink oil, as the latter is of variable nature, while castor oil (U.S.P.) is of uniform quality. It is maintained in the report of the above mentioned investigation that this test in conjunction with the smoothness test will yield information as to the printing quality of the paper. On page 10 of the report appears the statement that "Although there is no uniformity as to which side of the paper is more resistant, the felt side usually possesses the higher oil resistance." This is substantiated in the main by the figures in the appended supplement while Table III shows a very strong trend in the opposite direction. Nothing is said of the reproducibility of results obtained by this method. A study of the appended table shows that in some cases samples almost alike in respect to stock, ash, thickness and weight agree closely in time of castor oil penetration while in other cases there is no agreement whatsoever. This, however, may be due to such factors as differences in time of beating, amount of calendering, and amount of moisture, factors which may not show up in the thickness and ream weight. In the same report under the heading "Effect of Calendering" evidence is presented which shows that the oil penetration time is longer for calendered than for uncalendered paper, but that further calendering produced either no change or even a decrease in the penetration time. These results do not check with results to be presented later in this paper. Further the test does not seem to be sensitive to variations in calendering. Since calendering must exert considerable effect on the internal surface due to pressing together of the fibers, the test does not appear to be a measure of that surface available for oil absorption. According to the graph on page 23, showing the relationship between oil absorption and porosity of newsprint, the one is indicated to be a straight line function of the other. Insufficient information is presented to show how this is obtained from the figures presented in the tables. However, the question may be raised as to whether the two tests are not measuring the same thing, that is, the porosity of the sheet.

Certainly penetration tests of this type do not approximate printing conditions. One side of the paper is flooded with excess of the liquid. The weight of the paper is either resting on this or else a column of the liquid is standing on the paper, as in the Williams tester. On the other hand it has already been pointed out that in actual printing the amount of ink oil present seems insufficient to flood the pores but may be drawn along the internal surfaces by surface forces.

The test just described has also been studied by Reed *(10)* who compared results obtained by this method with that obtained from an "oil drop method," in which a drop of No. 000 linseed oil varnish is allowed to fall on the paper, and the time for complete penetration is noted. It is shown by Reed that "results by both methods give similar ratings as to oil resistance." This is substantiated by results obtained in the present investigation. This relationship is to be expected since in both of these methods conditions are fundamentally the same—at least a portion of one surface is in contact with excess of the oil.

(3) Absorption Tests

It was felt that information as to the actual surface available for absorption of ink oil might better be obtained by a method involving the time required for absorption from the paper surface of a small, definitely known quantity of oil, rather than by penetration tests of the type described above. The literature revealed certain tests which seemed applicable, with modifications, to newsprint. Related to these is the Klemm Test *(11)* for determining the absorptiveness of blotting paper. This consists in suspending strips vertically with their lower ends dipping into water and noting the rise by capillary action in ten minutes, or the time required for the water to rise to a certain height. Reed *(11)* reports that this test is unaffected by the width, thickness, or weight of the paper. In any event, as far as newsprint is concerned, water could not be used as the absorbate, since as swelling occurs, the structure of the sheet is entirely changed. A number of tests for absorbent papers such as blotting paper and paper towelling, involve the noting of the time required for absorption of a drop of ink or other liquid. Reed, *(11)* in a discussion of tests of this type devised by Sindall, Cross and Bevan, and Stevens, concludes with the presentation of a method whereby a 4-inch square of paper is placed on a beaker under a 1-cc. pipette, one half inch above the paper. The time for complete absorption is measured. A refinement of this is described by Carson and Worthington *(12) (13)* who state that a drop, of volume no larger than .01 cc., can be delivered with reasonable accuracy onto the surface of the paper.

It was felt that if the size of the drop could be reduced

still further and its weight accurately determined, a modification of this test might be applied to the surface of newsprint. The present paper deals with the investigation of such a method, and its application to a variety of samples of newsprint. For purposes of comparison the same samples were also subjected to penetration tests using standard methods.

Acknowledgment

The authors wish to acknowledge their indebtedness to I. H. Andrews of the Powell River Company, Powell River, B. C., who supplied the majority of the samples, and also made many helpful suggestions.

Penetration Tests

A penetration test is to be understood as meaning a test in which the time is measured for penetration of the oil from one side of the sheet to the other.

EXPERIMENTAL

The castor oil flotation test as described in the report of the investigation carried on at the Government Printing Office, Washington, D. C., was used. Two-inch squares of each sample of paper were so selected from the sheets as to be as representative as possible. Each square was floated on castor oil in a shallow dish, and the time between contact of the paper with the oil and saturation of the supper surface, was taken with a stop-watch. A test consisted of at least ten trials. A lamp, with reflector, was arranged above the dish but at such a height that the temperature at the testing-dish was the same as that recorded on an adjacent thermometer. A record was kept of the temperature and humidity during testing. In some cases tests were made on both wire side and felt side of the paper. The same test was carried out using news ink instead of castor oil, but difficulty in determining the end point, due to a gradual deepening of color from gray to black, made this unworkable. Paper samples used in these tests, unless otherwise specified, were supplied by the Powell River Company, Powell River, B. C., and contained no size or filler.

It was felt that further information might be obtained by using smaller quantities of the penetrating liquid. Hence an oil drop penetration method was adopted in which the procedure was exactly as described later in this paper for the "Oil Absorption Method" except that the time for complete penetration through the sheet was measured with a stop-watch. This was taken as the interval between contact of the drop with the paper and the formation of a continuous film on the reverse side. Tests were made with ink oil, castor oil, and cod-liver oil. The results of these tests were in every respect analogous to those obtained by the castor oil flotation test.

RESULTS

In Table I are summarized the results of tests to show the relationship between time of oil penetration and variations in composition, in terms of ground wood content, the remainder being sulphite pulp. Each time shown is the average of ten trials. The temperature was closely regulated, the minimum recorded being 24 deg. C. and the maximum 26 deg. C. The temperature recorded on a wet bulb thermometer varied only from 18.5 to 20 deg. C. so that there was little variation in relative humidity. All results are for the wire side of the paper. The samples used in tests one to seven were probably not comparable as there were undoubtedly differences in calendering. Samples 8, 9, and 10 were approximately the same in all respects except composition. Samples 11 to 14 were carefully made on an experimental machine by the U. S. Bureau of Standards and may be expected to vary only in percentage of unbleached sulphite. Samples 15 to 17

TABLE I

Test	Per cent Ground Wood	Thickness 1/1000"	Ream Wt. in Pounds	Time in Seconds	Per cent Spread
1	60	3.58	...	44	27
2	70	3.63	...	37	21
3	78	3.48	...	50	30
4	82.5	3.43	...	53	34
5	84.3	3.56	...	57	32
6	85	3.79	...	56	18
7	89.3	3.79	...	69	14
8	67.2	3.65	63.2	35	17
9	77.1	3.65	62.6	47	9
10	84.7	3.62	62.2	52	19
11	40	3.17	67.0	254	29
12	60	3.81	68.3	95	24
13	80	4.02	70.8	112	19
14	100	4.19	70.8	76	12
15	40	3.15	62.6	61	32
16	60	3.60	64.3	64	23
17	80	3.68	63.4	60	15

were the same as 11 to 14, except that bleached sulphite was used. The percentage spread shows the variation between longest and shortest time for each sample, based on the average.

A number of tests were made on both wire and felt sides of the paper. In each case penetration was found to be more rapid from the wire side.

Table II shows the results of tests to determine the relationship between the castor oil penetration time and variations in calendering. Lots 8 and 9 were calendered and uncalendered, respectively, containing 79 per cent of groundwood pulp. Lots A and B were prepared from lot 8 by placing the sheets between smooth metal plates and then subjecting them to pressure in a hydraulic press to compact the fibers. The object of this was to reproduce as well as possible the effect of calendering. Lots C and D were prepared from lot 9 in the same way. Temperature and humidity were closely regulated. Results are for the wire side of the paper, and each time is the average of ten trials.

Discussion of Results

In Table I, tests 1-7 show that as the groundwood content decreases from 89.3 to 70 per cent the penetration time decreases. This appears reasonable if higher groundwood content means a greater number of paths for removal of the oil and hence a longer time to penetrate to the other side. It is difficult to account for the sudden increase in time when the groundwood content decreases to 60 per cent. Variation in calendering hardly seems to be the reason as, according to Table II, the test is not sensitive to differences in calendering. Tests 8-10 show a decreasing penetration time with a decrease in the percentage of groundwood. However in tests 11-17 where there is every reason to expect uniformity in the manufacture of the paper, there is no relationship between oil penetration time and percentage composition. It should be pointed out that the sample used in test 11, seemed to have been overcalenderd. The figures for tests 15, 16, and 17 are not directly comparable to those of tests 11-14 inclusive, as each square of paper had already been used for an absorption test and so had taken up one drop of oil. In general these results indicate that the test is not sensitive to variations in sulphite content.

Table II shows a fairly marked difference in oil penetration for calendered as compared with uncalendered paper, the latter giving the longer time, a result just the reverse of that obtained by the Government Printing Of-

TABLE II

Lot No.	Pressure in Lb./sq. inch	Duration of Pressing	Thickness in 1/1000"	Time in Seconds	Per cent Spread
9	...	.....	5.84	54	22
C	200	2 hrs.	4.61	46	18
D	350	2 hrs.	4.10	46	24
8	...	.....	3.60	43	23
		~ s.	3.01	44	29
B	500	2 hrs.	3.01	44	29

fice, Washington. This may mean that the effect of calendering may be to press the fibers together, decreasing the surface available, and hence shortening the time of penetration through the sheet. On the other hand, increases in calendering pressure produce no significant change in these times. The test does not indicate variations in calendering.

Oil Absorption Test

An absorption test is to be understood as meaning one in which the time for absorption of a small quantity of oil from one surface of the paper is measured.

Experimental

A thistle tube with 12-inch stem was connected to a short piece of glass tubing of the same diameter by means of a ¾-inch length of black gum rubber. The short length of glass had been drawn out to a very fine capillary tip. Drop weights from .00235 to .01190 grams were obtained by using different tips. The thistle tube was filled with cod-liver oil (or other liquid) taking care to remove all air bubbles. If the time interval between drops, taken with a stop-watch, increased without the head of oil having changed appreciably, it indicated some small particle blocking the tip. Before making any test, the rubber tube was pinched between the fingers to remove any obstruction, and several drops were allowed to fall into a beaker placed for that purpose. By taking these precautions no difficulty was experienced in obtaining drops of uniform weight. Drops having a weight of the order of .004 grams were found to give satisfactory absorption times for most samples, but if the paper absorbs very slowly, smaller drops should be used. A two inch square of the paper sample was placed on a beaker so that the tip of the capillary was ½ inch above the paper. The stop-watch was started at the moment of contact between drop and paper, and the beaker supporting the two inch square was drawn to one side so as to be directly under a lamp with reflector, the lamp being at such a height as would give no rise in temperature at the surface of the paper. The end point was taken to be the instant at which reflected light was no longer visible on the surface of the drop. At least ten trials constitued a test, and the paper samples were chosen to be as representative as possible. Each day's work began with a test on a paper sample used the preceding day and the reproducibility was noted. A record of the temperature and humidity for each test was kept, these factors being regulated within close limits.

For a given sample of paper the possible variables in this test are as follows: (1) weight of the drop. (2) height of fall of drop. (3) End point. (4) humidity of the air and paper. (5) nature of the oil. (6) temperature of the air and oil. Codliver oil was used of specific gravity .918 and viscosity 146 S.U. at 100 deg. F. It was found that the weights of ten drops to five decimal places varied by only 3.5 per cent. The variation in drop weight was probably much less than this as there were small variations in the weight of the watch glass. The use of drops of ten different weights on Bureau of Standards paper samples, showed the absorption times to be proportional to drop weights.

Reed *(11)* has pointed out that changes in the height of the tip above the paper do not affect the absorption time as long as the distance does not exceed ½ inch. There is no difficulty in determining the end point except when uncalendered paper is used. In this case the rougher surface seems to make more difficult the determination of the instant when light reflected from the surface of the drop is no longer visible. Campbell *(14)* showed that the time of ink penetration decreased with an increase in humidity. It is likely then, that humidity exerts some effect on absorption time. The variations in this factor during these tests were slight, and before testing, all paper samples were left exposed to the air in the room for some time. The test was made with a number of different oils and the results appear later in this paper. A number of tests were performed to determine the effect of temperature of the air and oil on the absorption time. The various temperatures were obtained by adjusting the position of the lamp at different heights above the test-paper, keeping a thermometer beside the latter. Before each test the paper samples were exposed at the given temperature for a period of fifteen minutes. The drop apparatus was just to one side. In each test the two-inch square was quickly placed under the capillary tube, a drop received, and the paper at once returned to its position on a beaker under the lamp. The small quantity of oil contained in one drop would undoubtedly attain the given temperature very quickly.

Preliminary tests were made to obtain evidence as to the number of tests necessary on a given sample to obtain a reliable result. Ten groups of tests each consisting of ten trials, or 100 trials in all were made, employing the same drop weight throughout. By performing eight tests on two-inch squares of paper, ten on six-inch squares and ten on ten-inch squares, and selecting the squares from seven large sheets of paper, carrying out 420 tests in all, information was obtained as to the effect on the absorption time of the distribution of the drops over the surface of the paper. Tests were made on the same sample at intervals over a period of five weeks to determine the reproducibility of results.

Results

The preliminary tests referred to above showed that a reliable result may be expected from the average of ten trials. On the whole there appeared to be no particular trend over any portions of the paper. A study of the percentage spreads led to the conclusion that the surface of the paper is extremely variable and may vary as much on a two-inch square of paper as on a larger one. The results obtained by this method are reproducible within 6 per cent of an average which would be obtained from say 100 trials. It was found that as the temperature increased from 25.5 to 35 deg. C. there was a fairly uniform decrease in absorption time per degree rise in temperature. For uncalendered paper the time decreased by 50 per cent within the above temperatures. The need for conducting the tests at constant temperature is apparent.

Table III (a) shows the results of tests to determine the effect of using different oils. The ink oil showed a viscosity of 180-190 S.U. at 130 deg. F. and sp. gr. 23 A.P.I. The cod-liver oil was a standard brand with viscosity 146 S.U. at 100 deg. F. and sp. gr. .918. The mineral oils were of viscosity as shown in the table. For a given oil the same tip was used throughout but varied for the different oils. The temperature was controlled between 24 and 26.5 deg. C. Humidity variations were slight. The figures give the oil absorption time in seconds.

Table III (b) summarizes the results of a test designed to compare the figures obtained by using cod-liver oil with those obtained by using mineral oil of viscosity S.V. 155. The first three paper samples were the same as for tests

TABLE III(a)

Per cent Ground Wood	Ink Oil	Olive Oil	Cod Liver Oil	S.U. 112	S.U. 155	S.U. 210
85	760	390	236	...	...	...
60	1400	715	439	...	...	...
79 (uncal'd)	380	207	135	66	98	160
79 (cal'd)	1070	539	365	197	279	457

TABLE III(b)

Oil	100 Per cent G.W.	80 Per cent G.W.	60 Per cent G.W.	Lot 9	Lot C	Lot D	Lot 8	Lot A	Lot B
Cod-liver ..	362	511	619	139	276	426	450	577	670
Mineral	297	447	482	98	149	243	265	376	411

12, 13, and 14 and in Table I, while the remainder were as described in Table II.

Table IV shows the results of a test to determine the effect of variations in groundwood content on the absorption time. The samples of paper used were as described tion time. he samples of paper used were as described in Table I. The dry bulb temperature was controlled between 24 and 25.5 deg. C. while the wet bulb readings ranged from 15 to 18 deg. C. Cod-liver oil in drops of .0044 grams was used throughout.

TABLE IV

Test	Per cent Ground Wood	Absorption Time Wire Side	Absorption Time Felt Side	Per cent Spread Wire Side	Per cent Spread Felt Side
1	60	443	521	36	26
2	70	284	337	22	40
3	78	482	551	33	33
4	82.5	482	543	58	60
5	84.3	479	556	52	33
6	85	330	417	25	33
7	89.3	324	414	38	33
8	67.2	375	...	39	..
9	77.1	449	...	48	..
10	84.7	324	...	25	..
11	40	2922	...	4	..
12	60	619	...	13	..
13	80	511	...	20	..
14	100	362	...	12	..
15	40	1004	...	15	..
16	60	594	...	17	..
17	80	419	...	9	..

Tests 1-7 were repeated under the same conditions and in each case results were found to agree within 6 per cent, except in No. 2 where a time of 326 seconds was obtained for the second trial on wire side.

In Table V are recorded the results of a test to find out the effect of variations in calendering on the absorption time. The samples of paper were the same as in Table II. The dry bulb temperature for this test was 24.5-25.5 deg. C. and the wet bulb was 17-18 deg. C. The readings for two tests are shown.

Tables III(a) and III(b) show that the different oils used grade the paper samples in the same way. Table III(a) indicates a marked increase in absorption time as the groundwood content decreases from 85 to 60 per cent. Tests 1-10, inclusive, in Table IV suggest either that the test is not sensitive to variations in groundwood content or else there is some other factor outweighing this effect. Further information from the Powell River Company indicated that there were undoubtedly variations in calendering, and the results could not be considered as comparable. Samples 5 and 6 make this quite clear, for the groundwood content is practically the same for both and yet the absorption times are 479 and 330 respectively. The reproductibility for these tests is good and yet in some cases the percentage spread is over 50 per cent. Evidently each sample as a whole has certain definite characteristics peculiar to it, but there are marked variations in that one sample. This is not surprising considering the appearance of these sheets when held between the eye and a source of light—the sheet is obviously far from uniform, being much more opaque in some spots than others. These tests show the wire

TABLE V

Lot No.	Stock	Absorption Time Test I	Absorption Time Test II	Per cent Spread Test I
9	Uncalendered	139	137	31
C	Uncalendered + 200 lb.....	276	280	36
D	Uncalendered + 350 lb.....	426	417	79
8	Calendered	450	416	33
A	Calendered + 250 lb.....	577	549	44
B	Calendered + 500 lb.....	670	684	48

side to be more absorbent than the felt side. Tests 11-17 show that as the groundwood content decreases the absorption time increases. The abnormal figure in test 11 is clearly due to overcalendering. There is every reason to expect that in samples 12-17, the only factor which varies appreciably is composition. The low percentage spreads indicate uniformity of surface. The increase in absorption time with decrease in groundwood content is to be expected if we think of a higher groundwood content as meaning a larger number of small fibers and hence a greater surface available for absorption of the oil from the surface of the paper. It appears, then, that for comparable samples, the test is sensitive to changes in the composition of the paper. It has been noted that the castor oil flotation test when applied to samples which were comparable, did not prove to be sensitive to variations in composition of the paper. Table V gives evidence of the effect of calendering upon the absorption time. Not only does this test show a marked difference between calendered and uncalendered paper, but further it is very responsive to increases in calendering pressure. As the latter increases the absorption times increase. This is entirely in line with the view that the effect of calendering is to flatten down the surface, probably closing some of the pores and at the same time compacting the fibers so as to give less surface available for the adsorption of the oil. This should be compared with the castor oil flotation test, which gave very little difference between calendered and uncalendered paper and was not at all sensitive to changes in calendering pressure. It would appear that in the absorption test there is involved the surface actually available for absorption apart from the porosity of the sheet.

In conclusion, it is felt that this test shows definite promise of giving information concerning the absorption of a small quantity of oil from the surface of newsprint, —and this is essentially what must take place during printing. Further work is necessary, particularly along the lines of seeking correlation between this test and actual printing tests.

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Reprinting of TAPPI Standard Paper Testing Methods

A reprinting of the standards of the Technical Association of the Pulp and Paper Industry has been made to bring them up to date with respect to inclusion of new methods and revisions of old ones. Many changes have been made in the paper testing methods since they were first printed. Of the 37 methods now available in printed form, 20 have been revised, and methods for acid soluble iron, pH, and arsenic have been added, since the last printing. Copies of the methods can be purchased from the Technical Association of the Pulp and Paper Industry, at 122 East 42nd street, New York City, for 25 cents each. A list of the methods, with the date of the present correct copy of each, can be obtained from the chairman of the TAPPI Paper Testing Committee, B. W. Scribner, National Bureau of Standards, Washington, D. C.

Testing Fiber Building Boards and Pulp*

By Edwin C. Jahn[1]

Abstract

This paper presents, first, a summary of some of the testing methods described in the literature and, second, a discussion of a few of the tests carried out on fiber boards at the Idaho School of Forestry.

Part of the research program of the School of Forestry of the University of Idaho includes studies on the development and improvement of structural products made of fibers and also of plasticized wood particles. In connection with these studies it is necessary to carry out various strength and other physical tests. Prior to the selection of test methods a survey of the recent literature on testing methods for structural and building fiber boards was made.

Survey of Fiber Board Testing Methods

The criteria for the kinds of tests carried out on fiber boards are the characteristics required for the various uses to which the boards are put. Fiber building boards vary widely in dimensions, density, finish, kind and nature of fiber, and in other properties. On the basis of use commercial fiber building boards may be grouped broadly into three classifications, namely wall boards, insulation boards, and hard pressed boards. Wall boards and insulation boards are made in two structural types, laminated and homogeneous. Most laminated boards are of higher density than the homogeneous boards. For this reason most insulation boards are of the homogeneous type, whereas laminated boards are used principally as wall boards. Hard pressed boards are usually of homogeneous structure, but have been subjected to high pressure.

The important properties to be determined as regards use are as follows:

(1) *Wall boards*—strength, water and moisture absorption and consequent dimensional changes, surface finish and ability to take paint and decorations, ability to withstand abrasion.

(2) *Insulation boards*—thermal conductivity, strength, water and moisture absorption and consequent dimensional changes, plaster adhesion, sound absorption.

(3) *Hard pressed boards*—strength, density, hardness, water and moisture absorption and consequent dimensional changes.

Time will not permit a detailed description of the various tests used for fiber boards. Only the important factors regarding each test will be briefly discussed.

Tests on Stock

The literature on this subject is scant. The pulp fibers used for fiber boards vary from relatively slow ground wood and waste paper pulp to very coarse free fibers. Most insulation boards are made of coarse free pulp and for this reason the ordinary test methods used on paper stock can seldom be applied. The experience of different plants[2] with regard to freeness and other pulp tests appears to depend upon the nature of the pulp used *(6)*. The tests most commonly carried out in a routine manner are consistency, acidity (pH), fiber length, and freeness. Mills using a very free and coarse fiber find the freeness test of little value, whereas others using slower pulp carry out routine freeness tests by one of the standard freeness testers used in the pulp and paper industry.

Robert M. Boehm *(3)* of the Masonite Corporation has developed a modified Schopper-Riegler freeness tester for determining the stock characteristics of pulp having long coarse fibers, such as are generally used for insulating boards. Boehm enlarged the bottom or slow water orifice from 0.095 to 0.375 inches in diameter, increased the volume of the pulp chamber from 1 to 5 liters, and also increased the consistency of the stock used to 0.5 per cent. These changes increased the degree of sensitivity of the apparatus with very free pulps.

Boehm points out that other methods to give a numerical value for very free fibers are not applicable to control work. Such methods are visual examination, fiber count, and fractional separation. The sedimentation tester was also found to be unsatisfactory.

Test boards are not formed for control tests. However, some laboratories and mills have devised modified sheet machines for carrying out tests of a research nature. Schafer and Carpenter *(17)* describe the formation of test boards of groundwood fiber by using a large suction sheet mold.

The standard sheet molds used for pulp testing work have generally been found unsatisfactory *(6)* for making test boards.

Thickness and Density

Thickness, density, and certain of the strength tests, such as rupture and tensile, are closely followed as routine control tests. Since thickness and density are factors of great influence on other properties of the board, particularly strength and thermal conductivity, it is necessary that they be accurately measured.

The federal specifications *(7)* and the commercial standards *(25)* for insulating boards specify that thickness shall be determined with a micrometer to an accuracy of 0.01 inch and that an average of twelve readings shall be reported as the thickness of the sample. Various types of micrometers are used by the industry, and some mills measure to an accuracy of 0.001 inch. Other methods of measuring are described in the literature *(9)*.

The measure of density depends upon accurate dimensional measurements and weight at a known moisture content. Density is usually expressed as pounds per cubic foot.

Strength Tests

The strength factors measured may include modulus of rupture, transverse strength, elasticity, deflection, tensile strength, compression, hardness, abrasion, bursting strength, nail holding strength, and plaster bond strength. There are numerous types of apparatus used for obtaining a measure of these strength factors. The degree of accuracy in many cases varies with the design of the apparatus.

The tests which are most commonly made by the different plants *(6)* are for tensile strength, modulus of rupture and of transverse strength, and deflection. Most

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[2] Reference to methods used in the industry is based partly upon correspondence and partly upon manufacturers' bulletins and literature. For the information obtained by correspondence appreciation is given to Armstrong Cork Products Company, National Bureau of Standards, The Celotex Company, Fir-Tex Insulating Board Company, The Insulite Company, Masonite Corporation, Stewart Inso Board Corporation, Underwriters' Laboratories, United States Gypsum Company, The Upson Company and Wood Conversion Company.

plants use one or more of these tests as regular routine control tests.

Tensile Strength—A tensile strength test is included in the federal specifications *(7)* and commercial standards for insulating boards *(25)*. Air-dry samples 4 inches wide and not less than 10 inches long are tested on a tensile testing machine complying with specified requirements.

A variety of makes of tensile testing machines are used by the industry *(6)*, such as the Olsen, Perkins, Scott, and Riehle. Some mills use tensile testing machines of their own development.

Tensile strength in fiber boards is a measure of the factors of structural felting and cohesion of the fibers of the board and of its elasticity. Fiber boards are subjected to certain pulling forces along with other stress forces in many types of construction. However, resistance to flexural bending and breaking is the most essential strength property. Large board sheets must be strong enough to permit easy handling and erection without breaking. Such boards may be considered sufficiently strong for ordinary structural requirements *(27)*.

Bending Strength Tests—Scribner and Snyder *(20)* in a study of the physical properties of binders boards point out that binders boards may have a high resistance to stresses applied in tensile and bursting tests and yet lack the degree of flexibility that will enable them to withstand deformation and breaking under bending stresses. The flexural test was found to give data of equal reproducibility to the tensile test and it has the further advantage of simplicity. These same considerations should apply in large degree to most fiber building boards.

Heritage, Schafer, and Carpenter *(9)* selected strength and stiffness in static bending as the types of resistance to rupture and deformation that are most important relative to use and most easily determined.

Flexural Strength. Investigators of the Bureau of Standards *(19, 27)* have developed a simple flexural strength test for fiber boards. This test is specified in the federal specifications for wall board *(8)*. Test specimens 3 x 18 inches are supported on parallel iron pipes spaced 12 inches apart. A load is applied at the center at a constant rate by a tensile strength machine or by adding shot to a bucket. The breaking load is recorded.

Deflection Test. Federal specifications *(7)* and commercial standard *(25)* for fiber insulating board include a deflection test. Test specimens 4 x 12 inches are placed on horizontal parallel supports 8 inches apart and loaded at midspan with a 10 pound weight. After 30 seconds the deflection at the center is measured.

Static Bending. Investigators of the Forest Products Laboratory at Madison, Wis., have developed *(9)* and then improved upon *(18)* a static bending method for measuring strength and stiffness of fiber boards. The specimen is freely supported horizontally at two points and a load applied at the center of the span. By applying the usual engineering formulae the modulus of transverse strength, modulus of rupture and modulus of elasticity may be determined.

These numerical measures of strength and stiffness have the advantage of independence of the actual dimensions or loads. That is not the case in the flexural strength and deflection tests described previously, which are of an empirical nature.

The apparatus developed to obtain the data necessary to calculate these strength and stiffness properties is simple, and apparently of sufficient sensitivity and accuracy for the purpose. The loading medium is water flowing at a constant rate into a bucket hung by a stirrup on the specimen midway between the supports. A device for indicating and magnifying the deflection is mounted and attached to the stirrup.

Various other modifications of engineering apparatus have been used in determining transverse strength and modulus of rupture *(22)*.

Transverse strength and modulus of rupture are determined as routine control tests by a number of the mills, probably the majority. No standardized procedure is followed. The modulus of elasticity is measured in some plants. It is done primarily as a research test.

Bursting Strength—Wall boards have been subjected to bursting strength tests by the official methods of the Technical Association of the Pulp and Paper Industry *(19, 27)*. Insulating boards have been tested for bursting strength by dropping or applying pressure on a spear or peen against a board over a hole *(22)*. In either method of test the results indicate no regular relationship between the bursting strength and other strength factors such as flexural strength at rupturing load, modulus of rupture, or tensile strength. This may be due in part to a greater variation between individual tests in bursting than in the flexural tests *(20)*.

Hardness—Hardness is largely dependent upon density or the relative amount of air spaces in the board and also upon the structural felting and cohesion of the fibers. Other factors such as lamination, sizing, surface treating for finish, and the addition of materials to impart fire-resistance may affect hardness.

Most mills judge hardness from specific gravity or density measurements. Hardness is measured in at least one plant *(6)* by placing the board between two sets of three ball bearings in triangular formation with one set directly above the other. A given load is applied and the depression measured.

An impact hardness test for research is described by Sweeney and others *(22)*. A peen-shaped weight is dropped a given distance and the indentation in the board is read from graduations on the peen.

Compression Tests. Compression tests have been conducted by consulting and research laboratories on behalf of various manufacturers. The compression in inches or the per cent compression under given loads per square foot is recorded. Such tests are in the nature of sales service tests.

Abrasion Tests—Abrasion tests indicating surface hardness, toughness, and resistance to wear are carried out by various plants. These abrasion and wear tests are by no means standard and most manufacturers use a test of their own development *(6)*. Many of these tests are of a research nature.

Plaster Adhesion—Insulating boards are used to a large extent as a plaster base. A good plaster bond strength is therefore an important use requirement of this class of boards. The federal specifications *(7)* and commercial standards *(25)* for fiber insulating boards describe a plaster adhesion test. The force required to break the bond between the fiber board and plaster is measured by a standard tensile strength testing machine. Plaster adhesion tests are seldom carried out as regular routine tests *(6)*, but are done when needed or so that the product may conform to the federal specifications.

Nail Holding Strength—A nail holding strength test is described *(22)* for research investigations. The tensile strength required to pull the heads of four 6-penny nails simultaneously through the board is measured.

Structural Strength—Tests of a sales service nature have been conducted to demonstrate the rigidity given to framed structures by fiber boards. Panels covered with fiber boards have been shown to be stiffer and stronger in resistance to lateral distortion than panels covered with horizontal wood sheathing *(24)*.

Moisture Absorption and Expansion

Fiber boards, in common with other cellulosic materials, are subject to moisture absorption and dimensional changes with changes in the relative humidity of the surrounding atmosphere. The recognized importance of these moisture relation properties is shown by the fact that moisture absorption and expansion tests are general routine tests in the industry *(13)*. These tests give values indicative of the effectiveness of sizing or waterproofing. Several types of tests are made which may be grouped as follows:

Water Absorption—This is the most widely used of the various moisture absorption tests. Square samples (4x4 to 12x12 inches) are immersed vertically in water so that there is 1 inch of water above the tops of the samples. The samples are removed after various intervals of time, and the per cent gain in weight determined.

The Bureau of Standards' commercial standard on fiber insulating board *(25)* describes a very similar water absorption test.

Capillary Rise of Water—This is a routine test carried out by a number of mills. Samples of various specified demensions, usually in the form of strips, are stood vertically in a dish of water to a depth of 1 to 3 inches. After specified periods of time the samples are removed and the per cent gain in weight determined. In some cases the distance rise of the water also is measured.

Expansion or Swelling—Expansion due to moisture absorption is determined as a routine test in some mills. It is usually carried out in connection with the water absorption test. Increase in length or increase in thickness is determined after definite periods of immersion.

Federal specifications for insulating boards *(7, 25)* and for wall boards *(8)* specify a linear expansion test under very carefully controlled conditions. Instead of immersing in water, the samples are exposed to water vapor in an atmosphere of 93 per cent relative humidity.

Vapor absorption—The amount of water vapor absorbed by dry fiber boards when exposed to saturated water vapor is measured as a regular test by at least one plant. *(6)*

Bureau of Standards Studies—Studies carried out at the Bureau of Standards *(19, 27)* indicate that measurement of absorption and of expansion by subjecting samples to saturated water vapor are much more trustworthy than by immersion in water. It is pointed out that there are too many gross discrepancies to justify the use of the simpler immersion test to replace direct measurements of expansion resulting from the absorption of moisture from the atmosphere.

Moisture Content—Moisture content is a general routine control test. It is usually determined by drying a sample of specified size to constant weight at 105 deg. C. Distillation with xylene is the procedure used in some mills.

Arnold *(2)* describes a rapid method for the determination of moisture and also of the consistency of insulating board plup by refluxing the sample with xylene and collecting the water in a calibrated trap.

Thermal Conductivity—The heat insulating property of insulating fiber boards is naturally a most important one. Density is the most important factor influencing the thermal value of a board. The measure of heat flow through a fiber board may be obtained by a number of means, such as by the cold box method, *(22)* hot box method, and hot plate method.

Commercial laboratories frequently test built-up panels of insulating board by the standard hot box method as adopted by the American Society of Heating and Ventilating Engineers. *(1)* In this method the sample forms the top of a standard box, the interior of which is heated electrically to a constant temperature.

The hot plate method using an apparatus described by Van Dusen *(26)* is accepted as standard by the American Society of Heating and Ventilating Engineers *(1)* and by the government for its specifications *(7)* and commercial standards for insulating boards *(25)*

In brief, the apparatus consists of an electrically heated hot plate on either side of which is placed an oven-dried sample of fiber board. On the outside of each of these boards is placed a cold plate cooled by a circulation of brine or water. By measuring the temperature difference between the hot and cold plates by thermocouples and measuring the electrical in-put to keep the temperature constant the thermal conductivity may be calculated.

A recent study *(14)* of the hot plate method points out the interfering effect of moisture on the true insulating values. Peculiarities in the structure of any given boards are also shown to affect the thermal conductivity.

Special Tests

Numerous special tests are made by or on behalf of fiber board manufacturers. These are seldom control tests, but are rather in the nature of sales service tests, or of research tests. Some boards have special properties imparted to them such as resistance to molding or to fire. In such cases special test methods for evaluating these properties are carried out. Some of the more important of these tests will be briefly mentioned.

Sound Absorption—Fiber insulating boards are often used as sound deadeners and for their acoustical properties. Sound absorption depends mainly upon density and upon the surface structure of the board. Various reverberation methods of testing sound absorption *(24, 16, 11)* are in use.

Air Permeability—Air filtration through fiber boards is sometimes determined by applying a positive pressure on one side of the board and determining the flow by means of pressure and air movement on the other. Weber, Carson, and Snyder *(27)* state the heat transfer by air infiltration under usual conditions is of little consequence. Carson *(5)* has recently made a thorough study of the problem of testing permeability and has developed a sensitive test apparatus.

Surface Finishing Tests—Various methods are used by wall board manufacturers to determine the ability of the surface of the boards to take paints and to finish economically and satisfactorily.

Wet Strength—For research purposes the wet strength of fiber boards is determined by some mills. Samples are immersed a given period of time in water and the modulus of rupture determined.

Mold, Fungi, Insect and Vermin Resistance—Several products are on the market which offer resistance to molding, decay, and vermin. For testing these properties most mills prefer field tests under conditions favorable for attack by cellulose or fiber destroying organisms. Standard laboratory methods for testing the relative mold and decay resistance are also used. Hubert *(10)* describes laboratory and cellar decay tests on a number of commercial boards.

Fire-Resistance—Much experimentation has been done to produce an economical and effective fire-resistant board without detracting from any of its other desirable qualities. Several products are now on the market offering varying resistance to fire.

There is a lack of standard testing methods for measuring fire-resistance. Many of the tests used are empirical and do not control variables, leaving much to the judgment of the operator. Studies at the University of Idaho *(15)* indicate that the Forest Products Laboratory "fire-tube" apparatus *(23)* may be used for measuring the fire-resistance of fiber boards as well as of wood.

Landt and Hausman *(12)* describe a method for testing

the time to initial flaming of construction materials by heating electrically at constant temperature. The average deviation from the mean value is about 2 to 5 per cent in most cases.

Summary of Recent Literature on Testing

The testing methods used by the various mills have been developed largely through experience with the products made in each particular plant. From the foregoing discussion it is evident that most testing methods are not standardized. The nature of the stock and of the final product varies greatly, which makes it difficult to apply standard tests in many instances, as for example, freeness. Most tests of a routine nature, however, could probably be made either by standard methods or interpreted to a standard basis.

The federal specifications for wall and insulating boards and the commercial standard for insulating boards form a nucleus of standard testing methods. The commercial standard for fiber insulating boards has been accepted by the industry in an attempt to establish reasonable uniformity in the physical properties of insulating boards. Practically all mills occasionally make tests to conform to these specifications, and some mills follow one or several of the methods in routine testing. For routine control testing, however, most mills follow a technique of their own development.

The routine control tests which appear to be most widely carried out are for consistency of stock, acidity of stock, freeness, thickness, density, moisture content, transverse strength, modulus of rupture, tensile strength, deflection or stiffness, water absorption, capillarity, and expansion or swelling by water. Other routine control tests followed by some mills include fiber length, screen analysis, per cent size, hardness, color, and vapor absorption.

Tests which are not of a routine control nature, but are more in the nature of research tests or of sales service tests include thermal conductivity, abrasion, plaster bond strength, surface finishing tests, sound absorption, air permeability, wet strength, splitting strength, fire-resistance and mold and decay resistance. Some of these, such as thermal conductivity, are of foremost importance and are carried out at regular intervals by many plants.

The values of some factors furnish a basis for judging other physical properties. Density, for example, gives a good indication of the thermal conductivity and sound absorption properties of a board.

Most manufacturing control tests are developed and selected on a basis of simplicity combined with reasonable accuracy for insuring the manufacture of a product of uniform physical properties. Although most of the tests used appear to be well suited for this purpose, it is evident from the literature that some are of doubtful value in revealing useful properties. The accuracy of many tests varies greatly with the refinements of the apparatus and technique. Furthermore the literature on several of the tests reveals imperfect knowledge regarding the influence of variable factors as well as differences of opinion. There is room for further intensive study in this field of testing.

Some Experimental Data on Strength, Hardness and Fire Tests of Fiber Boards

In connection with the research at Idaho on the development of structural products from fibers and sawmill wastes it is necessary to carry out various physical tests. A few of the tests which can be applied to fiber boards will be described. Tests have been made both on experimental pulp boards and on commercial fiber boards.

Preparation of Test Boards

Test boards were made by mixing 75 per cent mechanical pulp and 25 per cent sulphate pulp. The pulps mixed by a pulp agitator consisting of a slotted brass disc at the end of a shaft rotated at 1725 r.p.m.

The boards were made on a modified sheet machine, built on the same principle as that described by Shaw, Bicking and Snyder *(21)*. It is a suction mold having thre sections. The deckle box is 24 inches deep and forms boards 12⅜ x 11⅛ inches. This box rests on the couching plate which is covered with 60 mesh fourdrinier wire. The lower part or supporting box is fitted with a 2½ inch drain pipe having a quick-opening valve and a steam ejector for suction.

TABLE I.—PHYSICAL TESTS ON FIBER BOARDS

Board Number	Type	Thickness (Inches)	Density (Lbs./cu. ft.)	Modulus of Transverse Strength (Lbs./sq. in.) (Ave.)	Modulus of Rupture (Lbs./sq. in.) (Ave.)	Modulus of Elasticity (Lbs./sq. in.) (Ave.)	Impact Hardness (Depth in mm.) (Ave.)	Pressure Hardness: Depth in mm. (Ave.)	Pressure Hardness: Per cent Ave. Deviation
EXPERIMENTAL PULP BOARDS									
1.	75 per cent Mech. Pulp 25 per cent Sulphate Pulp..	.5	26.62	1056	1752	35790	2.7	...	...
2.	"	.5	22.80	892	1142	40600	3.0	...	...
3.	"	.5	19.02	835	888	38000	5.0	...	...
4.	"	.5	15.22	485	653	22170	5.3	...	...
5.	"	.5	11.42	103.7	317	35500	6.5	...	...
6.	"	1.0	20.55	1223	1321	40900	4.8	4.15 at 100 lbs. / sq. in.	1.90
7.	"	.622	20.55	1068	1185	36600	4.5	...	...
8.	"	.5	20.55	1004	1178	42800	5.0	...	...
9.	"	.375	20.55	858	1050	39200	3.2	...	...
10.	"	.252	20.55	923	1539	38000	3.0	...	...
COMMERCIAL INSULATING BOARDS								(Using 50 lb. pr./sq. in.)	
A.	Insulating Plaster Base; Wood Fiber	.505	23.30	135.2	193	9150	5.0	6.03	1.16
B.	Insulating Board Wood Fiber...	.473	22.20	266	353	24000	5.0	4.70	2.13
C.	Insulating Board Straw Fiber....	.395	20.35	274.5	439	15880	5.0	...	...
D.	Insulating Board Wood Fiber....	.481	19.02	251	332	14830	6.0	...	...
E.	Insulating Board Wood Fiber....	.493	18.40	469	493	32500	3.2	5.47	1.09
F.	Insulating Board Wood Fiber....	.473	17.54	317	341	19400	6.2	6.20	3.00
G.	Insulating Board Wood Fiber....	.946	17.33	51.7	70.1	1565	2.2	...	...
H.	Insulating Board Cornstalk Fiber	.442	16.72	326.5	307	15200	6.0	6.31	1.11
I.	Insulating Board Wood Fiber....	.501	15.29	276	374	15720	6.2	7.52	1.99
J.	Insulating Board Wood Fiber....	1.00	14.90	88.5	95.6	3780	9.2	...	...
K.	Insulating Board Wood Fiber....	.461	12.62	85.1	123.2	5240	5.3	...	...
COMMERCIAL WALL BOARDS AND HARD PRESSED BOARDS								(Using 100 lb. pr. / sq. in.)	
I.	Hard Pressed Board, Wood Fiber	.126	71.1	....	....	.....	..	0.50	1.00
II.	Hard Pressed Board, Wood Fiber	.130	68.6	2170	5000	199000	1.0	0.66	1.52
III.	Hard Pressed Board, Wood Fiber	.229	66.5	....	....	.....	..	0.57	3.51
IV.	Wall or Structural Board, Wood Fiber	.268	39.2	1109	1620	88100	2.1	2.30	3.91
V.	Wall Board, Wood Pulp	.158	37.0	794	1383	78200	3.0	3.24	2.80

The boards may be made of variable thickness or density by pressing in a graduated press mold. After drying, all samples (as well as the commercial boards) were con-

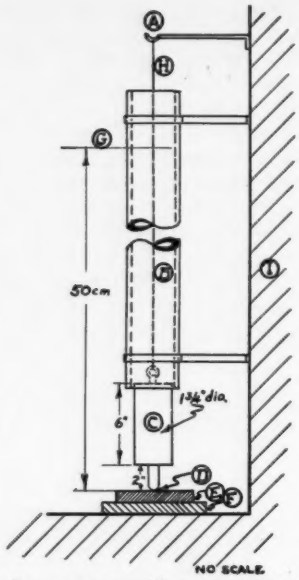

FIG. 1. IMPACT HARDNESS TESTER

A—Suspending hook. B—Two-inch guide pipe. C—Hammer, 4.47 pounds. D—Hemispherical tip, 0.444 inches dia. E—Sample. F—Iron base. G—Original hammer position. H—Suspending Cord. I—Wall.

ditioned at a constant relative humidity of 31 per cent at 24.5 deg. C.

STATIC BENDING

An apparatus was built according to the type developed at the Forest Products Laboratory at Madison *(9)*. An eight inch span is used in this apparatus. For very stiff and strong specimens a smaller diameter is used on the deflection pointer, which makes it possible to read exceedingly small deflections.

The average moduli of transverse strength, rupture, and elasticity obtained by Brown *(4)* on a number of boards are given in Table I.

IMPACT HARDNESS

Hardness to impact pressure was measured by a falling weight from a height of 50 cm. (See Fig. 1). On the lower side of the weight is a projecting rod having a hemispherical end 0.444 inches in diameter which penetrates into the sample resting on a solid iron block. The depth penetration is measured by calipering the distance between the shoulder of the weight and the sample. The difference between this distance and the length of the projecting rod is the depth of penetration.

Due to the tendency to rebound in many cases and to the possible degree of error in the method of reading, the values obtained by this method are neither so reliable nor sensitive as those obtained by the pressure hardness tester (See Table I).

PRESSURE HARDNESS

A steel rod with a hemispherical tip 0.444 inches in diameter is pressed into the sample under a given load. The rod is mounted on a one square inch piston which rests on oil in a cylinder. The pressure is read directly from a gage (See Fig. 2). The load is applied by a hydraulic pump. The instrument rests on the lower press plate of the pump. A small pin resting against the upper press plate operates an indicator which magnifies the actual depth of penetration about 15 times.

The instrument was designed for use on dense materials, and, set up at present, a load less than 50 pounds cannot be read. By using a lower capacity gage and pump, loads less than this could be used which should give reliable val-

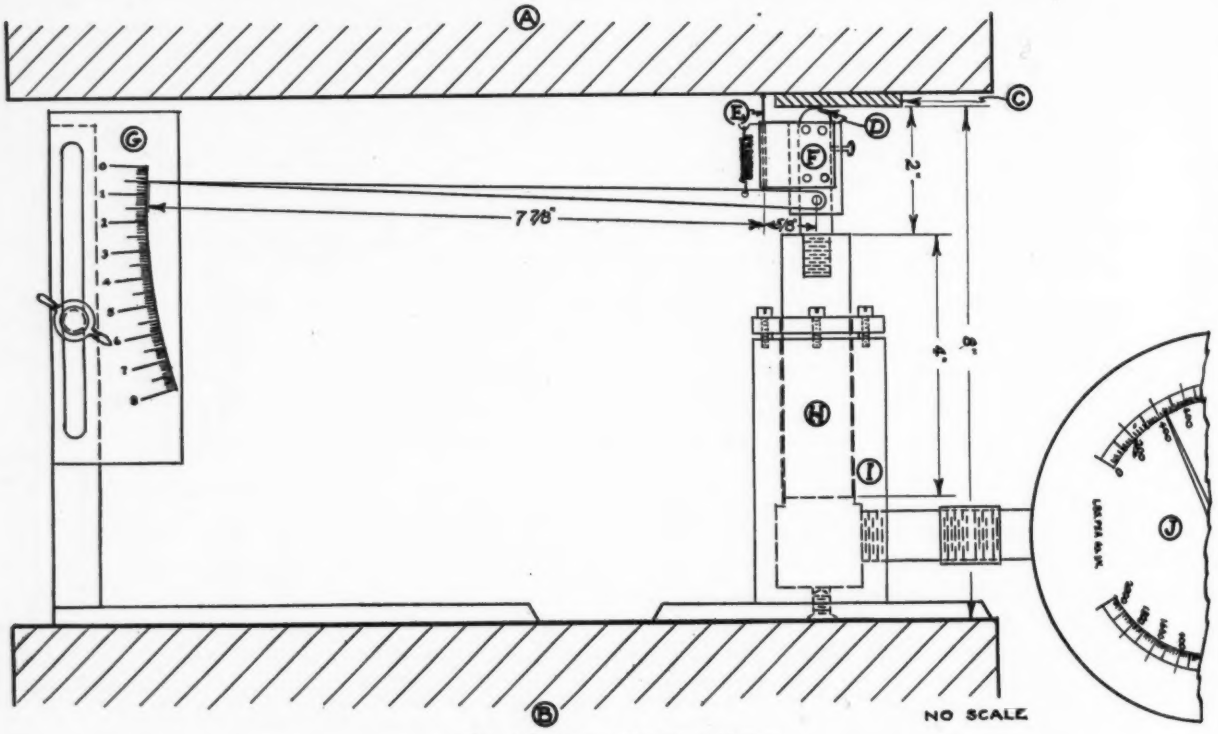

FIG. 2. PRESSURE HARDNESS TESTER

A—Stationary press plate. B—Movable press plate. C—Sample. D—Hemispherical tip. 0.444 inches dia. E—Indicator activating pin. F—Magnification mechanism. G—Scale. H—Piston, one square inch area. I—Oil Cylinder. J—Pressure gauge.

ues on light insulating boards. Thin specimens (.25 inches or less) and less than about 50 pounds per cubic foot in density should be tested in double layers.

This instrument is sensitive and gives reproducible results. An average deviation of only from one to under four per cent was obtained between individual readings (See Table I) which is not more than may be expected due to differences within the samples.

Fig. 3 shows the relation of hardness to density. A nearly straight line relation is obtained on the denser wall and hard pressed boards, whereas the less dense boards show greater variations. This is to be expected since hardness in the lighter boards depends to a greater extent on other factors besides density. These factors include the nature and strength of the fibers used, the degree of felting, and the cohesion of the fibers to each other. The insulating boards tested varied greatly in structure and in the nature of the fibers. Impact hardness tests on boards made of the same kind of fibers and in the same manner show a nearly constant relation to density.

Fire-Resistance

In connection with a study on the fire-proofing of fiber boards *(15)* tests were made by the Forest Products Laboratory apparatus which was developed for studies on wood. All tests were on experimental pulp boards made of 80 per cent sulphate and 20 per cent mechanical pulp.

Samples 33 inches long are hung in an open tube at the bottom of which is a Bunsen flame of constant temperature. The tube is hung on a beam balanced on knife edges. As the sample burns a pointer reads the loss in weight. The temperatures at the top of the tube are determined by means of a thermocouple.

Per cent loss in weight was found to be a much more dependable criterion than maximum temperature. The reason for this is probably due to the warping tendency of some of the samples during burning which deflected the heat toward the walls of the tube. This difficulty might be overcome by reducing the length of the samples and tube. A smaller flame might also give greater accuracy to the temperature readings.

Such factors as density and thickness of the fiber boards influence the test. Arrangement of the boards in the order of increasing weight, thickness or density reveals a constant decrease in the per cent loss in weight in the fire test except for boards of very low density *(15)*. The effect of these variables can be accounted for by reading from curves.

TABLE II.—FIRE-RESISTANCE OF PULP BOARDS TREATED WITH FIRE-RETARDING CHEMICALS

Chemical	Amount (per cent)	Maximum Temperature (deg. C.)	Loss in Weight at Four Minutes (per cent)
None	0	775	97
Zinc borate	5.8	464	85
Zinc borate	6.3	570	83
Zinc borate	7.6	434	80
Zinc borate	13.1	303	49
Zinc borate	47.1	150	13
Ammonium fluoride	8.6	575	87
Ammonium iodide	7.8	254	69
Ammonuim chloride	8.5	232	60
Ammonium bromide	5.9	211	54
Zinc chloride	8.2	212	48
Magnesium chloride	8.6	198	38

This test method gives reproducible results and is sufficiently sensitive for fiber boards with any effective degree of fire-resistance as examination of Table II shows. The method is not suited to test boards which offer moderate resistance to flaming or ignition at low temperatures, but which burn fairly readily after ignited.

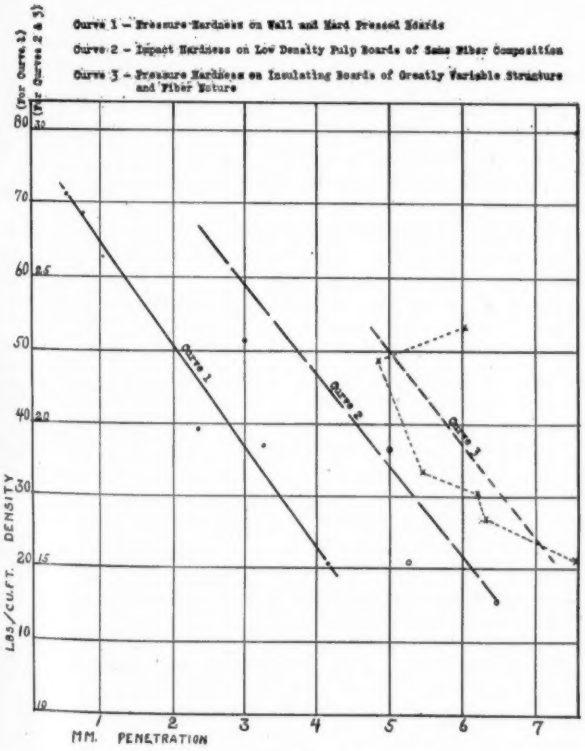
Curve 1 – Pressure Hardness on Wall and Hard Pressed Boards
Curve 2 – Impact Hardness on Low Density Pulp Boards of Same Fiber Composition
Curve 3 – Pressure Hardness on Insulating Boards of Greatly Variable Structure and Fiber Nature
(For Curve 1)
(For Curves 2 & 3)
LBS./CU.FT. DENSITY
MM. PENETRATION
Curve 1
Curve 2
Curve 3

FIG. 3
Density Hardness Relation

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Pulp and Paper Industry Literature Review

Abstracts of Articles and Patents Compiled by the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson, C. E. Peterson and Clarence J. West, Chairman

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Machinery

Shower Pipe for Suction Rolls. Albert H. Standley assignor to Downingtown Manufacturing Co. U. S. pat. 1,979,178 (Oct. 30, 1934).—The construction is such that the shower pipe can be removed (*e.g.*, for cleaning) without dismantling the roll and without breaking any actual pipe connection, by simply disengaging the shower pipe from a slip joint through which its connection with the water supply is provided.—A.P.-C.

Suction Box Top for Paper Machines. Jean Proulx. U. S. pat. 1,977,352 (Oct. 16, 1934).—The cover is made of a series of slightly graduated transverse sections which may be individually replaced when worn or otherwise damaged. The sections consist of blocks of hardwood having the grain substantially vertical.—A.P.-C.

Apparatus for Seaming Papermakers' Drier Felts. Thomas Hindle. U. S. pat. 1,976,169 (Oct. 9, 1934).—The felt, after being threaded into position on the machine, is stitched into endless form by a machine traversing between the overlapping ends, and the sewing machine is constructed with a central arm adapted to traverse between the folds or plies of the material, a needle mechanism carried by the arm above the material and a shuttle mechanism carried below the material.—A.P.-C.

Drying Laminated Paper Material or Boards. John C. Corcoran assignor to Superior Tool and Manufacturing Co., Inc. U. S. pat. 1,977,045 (Oct. 16, 1934).—Sheets of built-up paper board are dried by passing them around a series of drying rolls (like a continuous web of paper), the board sheets being held between two endless felts.—A.P.-C.

Paper Winder. Earl E. Berry assignor to Beloit Iron Works. U. S. pat. 1,979,310 (Nov. 6, 1934).—This is an improvement on Berry's U. S. pats. 1,870,224 and 1,870,225 (Aug. 9, 1932). It provides semi-automatic winder-shaft pulling mechanism and transfer mechanism which can be attached to existing winders to facilitate the operation of the machine and reduce the amount of manual labor.—A.P.-C.

Calender Roll. Archibald Lade. U. S. pat. 1,973,690 (Sept. 11, 1934).—A calender roll body is formed of superposed sections of fibrous material including degummed ramie fibers.—A.P.-C.

Improvement in the Manufacture of Paper. W. H. Millspaugh. Bel. pat. 403,774 (July 31, 1934).—The sheet is formed directly on a large vacuum forming-roll.—A.P.-C.

Fourdrinier Paper Machine. Fibroplast G.m.b.H. Fr. pat. 761,413.—Broader and thinner deckle straps are used, the narrow edge of which is in contact with the fourdrinier wire. The axes of the deckle pulleys are vertical, and the return strand of the strops is outside the wire instead of above it.—A.P.-C.

Slitter and Rewinder. J. M. Voith Co. Fr. pat. 768,129.—The knives are individually driven by small electric motors to which they are coupled directly. The motors are slidingly mounted on a common bar forming part of a vertically movable carriage.—A.P.-C.

Collapsible Winder Shaft. Frank E. Langdon. U. S. pat. 1,981,556 (Nov. 20, 1934).—This is an improvement on Langdon's U. S. pats. 1,631,538 and 1,811,237, which provides a construction wherein the collapsible portions of the shaft are supported transversely across their width instead of only along the center line.—A. P.-C.

Method of and Machine for Slitting and Stacking Folded Plies of Paper Web. Leslie T. Hand. U. S. pat. 1,985,676 (Dec. 25, 1934).—This is an improvement on U. S. pat. 1,747,719 for producing a stack of folded strip such as telegraph tape. It provides: a table having a suitable convex curvature; means for lowering the table as the height of the stack increases; rotating helicoidal members, disposed at opposite sides of the web stack and adapted to engage the successive folds of the descending web as they alight upon the stack, alternatively at opposite sides thereof, for compacting the stack; using circular knives each having a nick in its cutting edge, so that the web is divided into tapes which are still held together but are very easily separated after stacking.—A. P.-C.

Paper Making Apparatus. William R. Kellett assignor to Paper Patents Co. U. S. pat. 1,981,049 (Nov. 20, 1934).—The invention consists in an improved arrangement whereby lightweight paper can be transferred directly from the wire to the driers without passing through any presses, thus requiring but a single felt. The pick-up felt passes between the wire and a suction roll located below the couch roll; the web is transferred to the driers by means of a transfer suction roll; between the transfer point and the pick-up point the felt is washed by means of water sprays and dried by passing over a suction roll.—A.P.-C.

Fourdrinier Paper Machine. Francis S. McDonnell assignor to Herbert A. Baker. U. S. pat. 1,982,349 (Nov. 27, 1934).—Means for raising or lowering the table to alter the pitch of the wire are provided at a point approximately midway the table-roll section of the table.—A.P.-C.

Press Roll Drive. John J. Farrell assignor to Downingtown Manufacturing Co. U. S. pat. 1,983,126 (Dec. 4, 1934).—One of the rolls (preferably the upper) is driven from the other through a gradually variable driving connection, which is provided with means controlled by the relative peripheral speeds of the rolls for varying the speed of rotation of the driven roll.—A.P.-C.

Winding Machine. James A. Cameron assignor to Cameron Machine Co. U. S. pat. 1,984,784 (Dec. 12, 1934).—The winding rolls and the riding or top pressure roll are driven synchronously from the same source of power by means of a sprocket chain. A clutch is provided at each roll, whereby it can be disconnected independently of the others.—A. P.-C.

Calender Roll. Emil Gminder assignor to B. F. Perkins and Son, Inc. U. S. pat. 1,983,662 (Dec. 11, 1934).—The roll is built up of cottonized bast fibers, pure or mixed with other fibers, or is built up of disk-shaped sec-

tions some of which are of cottonized bast fibers, and the others are of different fibers.—A. P.-C.

Stock Consistency Indicating and Regulating Apparatus for Pulp and Paper Making Machines. Russell Carpenter. U. S. pat. 1,982,370 (Nov. 27, 1934).—Samples of constant volume are periodically withdrawn from the main body of diluted stock. The liquid is separated from the fiber of the samples and delivered to a weighing apparatus, the latter being counterweighted to just balance the weight of the liquid received from a sample taken when the consistency of the main body of stock is at the desired value. The operations are carried out in such a way that the weight of the liquid from any particular sample as indicated by the weighing apparatus bears a definite relation to the consistency of the stock at the time the sample was taken. The movement of the weighing apparatus which occurs when the weight of the liquid delivered is greater or less than the balancing weight is used for regulating the water supply valve to correct increase or decrease in consistency.—A. P.-C.

Apparatus for Feeding Fourdrinier Paper Machines. George D. Kilberry. U. S. pat. 1,984,484 (Dec. 18, 1934).—The object of the invention is to cause the stock to flow evenly on to the wire and to form itself, before draining starts, into a sheet of desired width and thickness moving in a quiescent state at the same speed as the wire. This is obtained by running a non-porous band around the breast roll and under the wire for a considerable distance. For certain grades of paper series of transverse parallel "equalizer blades" dip into the travelling pond of stock on the wire, and are driven at a speed that is preferably slightly slower than that of the wire.—A. P.-C.

The Influence of the Head Box and Slice on Sheet Formation. George D. Bearce. Paper Trade J. 100, No. 3:40-45 (Jan. 17, 1935).—A review of the principles and patents related to the control of paper sheet formation, with a discussion of the following basic principles of sheet formation: maintenance of a homogeneous and uniform distribution and dispersion of fibers in the head box, uniform delivery of the fiber suspension on to the wire, contact of the fiber suspension with the wire.—A. P.-C.

Failure of Granite Press Rolls. L. H. Cole. Pulp Paper Can. 35:637-640 (Nov., 1934).—From a study of press rolls at an Eastern Canadian mill which developed cracks lengthwise in the course of an approximately six months' shut-down, it is suggested that the probable major cause of the failure of the rolls was due to the corrosion of the steel shaft, causing an increase in volume, which exerted a pressure sufficient to crack the granite, and that such failure would probably be prevented by leaving free the space between the shaft and granite instead of filling it with sulphur or other grout.—A. P.-C.

The Taylor Press Roll Load Recorder. Frank Ward. Paper Trade J. 100, No. 2:43-44 (Jan. 10, 1935).—A discussion of its advantages and of the economies that can be affected by an accurate knowledge of press roll pressure.—A. P.-C.

A New Winder. Anon Mon. Papeterie Belge 14:678-679 (Nov., 1934).—A description of the Goebel, Darmstadt, winder, 2200 mm. wide, operating up to 200 m. per min. on boards of 200 to 600 g. per. sq. m.—A. P.-C.

Paper Making. New Jersey Zinc Co., assignees of O. Kress. Brit. pat. 419,790 (March 23, 1934).—Zinc sulphide pigment is added to the white water, maintaining the pH at not less than 4.5. It thus acts as a bactericide.—A. P.-C.

Barking of Pulp Wood in the Forest or at the Mill. F. G. Alfeld. Wochbl. Papierfabr. 65, No. 37:659 (Sept. 15, 1934). The author discusses the advantages of barking pulp wood at the mill.—J.F.O.

Barking of Pulp Wood. Wochbl. Papierfabr. 65, No. 37:660 (Sept. 15, 1934). Reasons, pro and con, for the barking of wood in the forests or at the mill.—J.F.O.

Device for Barking Drums Arranged in Series for the Barking of Long Logs. A. G. Johansson, Nalden. Swed. pat. 80,464 (June 27, 1932). The entrance and exit part of the drums is made smooth within while the other parts perform the actual barking.—J.F.O.

Problems of Wood Barking. I. Vuoristo. Papper-s-Trävarutid. Finland 16, No. 18:770, 772-774, 776-778; No. 20:844, 846, 848-850, 852-854, 857; No. 21:897-900, 902 (Sept. 30, Oct. 15, No. 15, 1934).—A detailed discussion is presented of the economical factors involved in the different methods of wood barking.—C.J.W.

Knotter with Vertical Axis, Especially for the Pulp and Paper Industry. Ernst Buchhaas, Prague, Czechoslovakia. Ger. pat. 599,616 (Nov. 15, 1932).—J.F.O.

Reel Stand for the Winding of Paper and Similar Materials. Zellstofffabrik Waldhof, Mannheim. Ger. pat. 599,354 (Aug. 28, 1932).—J.F.O.

Drying of Wood Chips. G. N. Lukjanoff and B. F. Balson. Zellstoff u. Papier, 14, No. 12:488-89 (Dec. 1934). Moist wood chips necessitates longer cooking time and an increase in sulphur consumption; for example chips with 45 to 50 percent moisture require 18 hours cooking time while chips with only 20 per cent moisture require 10 to 12 hours. Experiments were then made with various types of drying installations for the chips and the results are noted.—J.F.O.

A New Stock Consistency Regulator. Karl Bachmann. Zellstoff u. Papier, 14, No. 12:499-500 (Dec., 1934.) Description of patent by Voith for a stock consistency regulator in which the total quantity of stock passes through the regulator. The regulator depends on the change in height of the stock at varying consistencies.—J.F.O.

Device for the Recovery of Fiberous Materials in the White Water from Pulp and Paper Mills. C. B. Thorne, Hawkesbury. Ger. pat. 603,025 (Feb. 23, 1930.)—J.F.O.

Device for Automatic Direct Guiding of Moving Bands, Especially Wires and felts for Paper and Board Machines. A.G. der Maschinenfabriken Escher Wyss & Cie, Zurich. Czech. pat. 44,160.—J.F.O.

Screen for Pulp Digesters. Aktiebolaget Nordiska Armaturfabrikerna, Stockholm. Czech. pat. 46,871.—J.F.O.

Suction Cell, Revolving Drum Filter for the De-Watering of Strongly Diluted Pulp and Paper Stock. Maschinenfabrik Buckau R. Wolf Akt. Ges., Magdeburg. Ger. pat. 601,524 (July 3, 1928).—J.F.O.

Shaking Flat Screen for the Paper, Pulp, Ground Wood and Other Similar Industries. Firma J. M. Voith, Heidenheim. Ger. pat. 601,877 (Feb. 22, 1933).—J.F.O.

Suction Box for Paper Machines. Usines Ch. Catala, Virginal, Belgium. Czech. pat. 44,365. The suction box is provided with an endless, movable, perforated belt.—J. F. O.

Arrangement for the Automatic Setting and Maintaining of the Correct Position of Moving Bands and Webs. Emil Schrautzer, Graz. Aust. pat. 138,254 (Jan. 15, 1932). A jet of liquid is directed near the edge of the wire or felt.—J.F.O.

Making Suction Boxes for Paper Machines and Similar Apparatus Tight and Process for the Manufacture of Suction Boxes. Rohrbacher Lederfabrik, Vienna.

Aust. pat. 137,473 (Dec. 15, 1933). Addition to Aust. pat. 133,780. The top of the suction box is covered with leather which has been impregnated, and this cover is cemented to a wood foundation with a water-proof material. —J.F.O.

Tighenting of the Rings for Cylinders on Cylinder Machines. Alfons Bartsch, Karlsthal. Aust. pat. 137,881 (April 15, 1933). A border ring which can be displaced axially is arranged on the wall of the trough, and this ring is then fixed so that it touches a similar ring on the cylinder.—J.F.O.

Process and Arrangement for the Filling of Digesters. Fritz Muller, Nettingsdorf, Austria. Aust. pat. 137,500 (Dec. 15, 1933). The forcing of the chips does not take place until they are within the digester.—J.F.O.

Process for the Sorting of Paper or Similar Materials in Web Form or Sheet Form. Maschinenfabrik zum Bruderhaus, Reutlingen. Ger. pat. 576,010 (Dec. 5, 1930). Addition to Ger. pat. 531,126.—J. F. O.

Process and Arrangement for the Sorting of Paper or Similar Materials in Web or Sheet Forms. Maschinenfabrik zum Bruderhaus, Reutlingen. Ger. pat. 599,772 (April 12, 1931). Addition to Ger. pat. 576,010.—J. F. O.

Recent Grinder for Calender, Press and Similar Rolls, Drying Cylinders, etc. Papier-Fabr. 32, No. 22:258-59 (June 3, 1934).—Description and operation of a grinder manufactured by H. A. Waldrich G.m.b.H.—J. F. O.

Oscilation Problem in the Paper Industry. N. Wunderlich. Papier-fabr. 32, No. 20:229-31 (May 20, 1934). —The author first gives the derivation of the laws of an oscilating body and then discusses certain examples in the paper industry such as the shake at the wet end of a paper machine and in the latest beater construction.—J. F. O.

Vibration Problems in the Paper Industry. H. N. Wunderlich, Papier-Fabr. 31, No. 30:402-07 (July 23, 1933).—Thorough discussion of the shake of the wet end of a paper machine.—J. F. O.

Paper Machine Construction During the Year 1933. N. Wunderlich. Zellstoff u. Papier 14, No. 5:206-07 (May, 1934).—The outstanding improvements in the construction of paper machines are briefly discussed. The greatest advance was made in the wet end shake.—J. F. O.

Thickener with Forced Circulation of the Stock. A. A. Chlebnikoff, Zellstoff u. Papier 14, No. 1:19-20 (Jan., 1934).—Operating data and advantages of the thickener with forced stock circulation.—J. F. O.

First Press for the Preparation of Laid Paper. Compagnie Générale d'Electricité, Paris. Ger. pat. 599,-617 (Dec. 10, 1932).—J. F. O.

Process for the Sorting of Paper in Rolls or Sheets. Maschinefabrik zum Bruderhaus, Ger. pat. 531,126 (Aug. 16, 1930).—The paper passes over a drum capable of exerting suction or pressure to the paper, thereby making possible the removal of such paper as desired.—J. F. O.

Cutter for a Moving Band of Paper. Karl Krause Komm Ges. Ger. pat. 600,317 (June 23, 1933).—J. F. O.

Screen for Ground Wood, Pulp, Paper Stock and Similar Materials. J. M. Voith, Heidenheim. Ger. pat. 599,615 (April 19, 1932).—J. F. O.

Device for the Return of the Relief Gases and Liquors From the Top of the Pulp Digestor to the Bottom. Metallgesellschaft A.G., Frankfurt a. M. Ger. pat. 601,271 (Nov. 5, 1931).—By means of pipe lines within the pulp digester and an injector, the relief gases and liquors are returned to the bottom of the digester; being removed from the top.—J. F. O.

Tension Device for Board Calenders. Joseph Eck & Sohne. G.m.b.H., Dusseldorf, Ger. pat. 600,891 (April 13, 1933).—J. F. O.

Device for Moistening Paper and other Webs. Orion Maschinen und Apparatebau G.m.b.H. Dusseldorf, Ger. pat. 600,892 (June 4, 1933).—Two or more rows of spray devices are placed so close to each other that the conical sprays of water cut each other.—J. F. O.

Drives

New Lines of Development in the Construction of Electric Drives for Paper Machines. Zellstoff u. Papier 14, No. 9:353-55; No. 10:393-95; No. 11:436-39 (Sept.-Nov., 1934).—Description of individual motors for drying cylinders, winders, calenders, etc.—J. F. O.

Calender Drive. Allgemeine Elektricitats Gesellschaft, Berlin. Ger. pat. 603,098 (June 24, 1931).—The drive is so designed that when a break in the sheet occurs, the calender automatically stops operating.—J. F. O.

Electrical Individual Drives for Calender Rolls. Joh. Kleinewefers Sohne, Krefeld. Ger. pat. 602,889 (Nov. 2, 1930).—The rolls of a calender are each connected to individual motors so that they can be driven through their own power or by friction from the adjoining rolls.—J. F. O.

Drives for the Paper and Pulp Industry. Fritz Hoyer. Papier-Fabr. 32, No. 31A:59-72 (Aug. 5, 1934). —By means of numerous drawings and illustrations, the author gives a comprehensive picture of the many types of drives used in the German pulp and paper industry.—J. F. O.

Economic and Safety Features of Cubicle Type Motor Control Units. E. H. Vicary and K. L. Howe. Paper Trade J. 99, No. 14:40-44 (Oct. 4, 1934).—The design, application and safety features of cubicle type motor control for squirrel cage, synchronous and wound rotor motors are described and discussed.—A.P.-C.

Notes on Electrical Drives in Paper Mills. H. S. Carnegie. World's Paper Trade Rev. 102; 720, 722, 762, 764, 800-804, 840-846, 882, 884, 922-926, 1032, 1034, 1074, 1112, 1114, 1152-1158 (Sept. 7-Oct. 12, 1934).—A general discussion of the characteristics and performance of various types of electric motors, more particularly from the standpoint of paper mill service requirements.—A.P.-C.

Sectional Electric Paper Machine Drive. Brown Boveri and Co. Fr. pat. 765,271.—In a sectional electric paper machine drive in which the section drives are regulated by means of electric differentials, the rotor of the electric differential is fed by the group frequency generator which has constant excitation and is driven in known manner by cone pulleys from the section motor; the pilot frequency is fed to the stator of the differential through a contactor comprising an auxiliary contact by means of which a resistance in the excitation circuit of the pilot generator can be short-circuited, thereby increasing the excitation current of the pilot generator.—A.P.-C.

Progressive Paper Machine Drive. John A. Limpert assignor to Paper Patents Co. U. S. pat. 1,977,070 (Oct. 16, 1934).—The driving connections of the various sections are arranged in "cascade" instead of in multiple, so that when a change is made in the speed of any section, a corresponding change will be automatically effected in the speed of all the succeeding sections.—A.P.-C.

Power House

Preparation of Bark and Refuse As Fuel in Pulp and Paper Mills. Anon. Pulp Paper Can. 35:681-683, 706 (Dec. 1934).—A discussion of the advantages of disposing of bark and wood refuse as fuel, with a description of the construction and operation of the Northern bark press and its merits for the preparation of bark prior to burning.—A.P.-C.

Operating Practice in Switching and Power Distri-

bution in Pulp and Paper Mills. A. C. Bird. Paper Trade J. 100, No. 3; 45-46 (Jan. 17, 1935).—A brief summary indicating the operating practice and power distribution schemes prevailing in pulp and paper mills erected within the last few days in the United States and Canada.—A.P.-C.

Fourteen Inch Steam Line Between Public Utility Plant and Paper Mill. Ralph Smalley. Paper Trade J. 99, No. 21: 39-41 (Nov. 22, 1934).—a description of the construction and operation of the 14-inch steam line between the power plant of the Washington Gas and Electric Co. and the plant of the Longview Fibre Co., Longview, Wash.—A.P.-C.

A Review of Practice in Turbine Designs for Paper Mills, 1927-1933. A. G. Darling. Paper Trade J. 99, No. 24:41-42 (Dec. 13, 1934).—A.P.-C.

What Is Insulation? E. H. J. Barber. Pulp Paper Can. 35: 684-685 (Dec. 1934). — A brief explanation of the meaning and principles of low temperature heat insulation for buildings.—A.P.-C.

The Manufacture of Power Plant. Anon. World's Paper Trade Rev. 102; 1480-1486 (Nov. 16, 1934).—A survey of the activities of Browett-Lindley, at Letchworth. —A.P.-C.

Industrial Lubrication and Lubricants. O. L. Maag. Paper Trade J. 99, No. 24; 43-45 (Dec. 13, 1934).—A brief discussion of modern lubrication requirements. —A.P.-C.

Antifriction Bearings in Pulp and Paper Mills. A. T. Hurter. Pulp Paper Can. 35: 571-575, 600 (Oct., 1934). A general discussion of the principal factors for guidance in the analysis of the application of antifriction bearings and of their various applications in pulp and paper mills. —A.P.-C.

Design and Use of Clutches in the Paper Industry. George H. Pringle. Paper Ind. 16: 562-564 (Nov., 1934). A brief discussion.—A.P.-C.

Valves for the Pulp and Paper Mill Power Plant. William Heilig. Paper Ind. 16: 558-561 (Nov., 1934).—A discussion of the selection of valves for various services in the pulp and paper mill power plant.—A.P.-C.

Construction of Pipes and Pipe-Lines. James Strachan. Paper Maker & Brit. Paper Trade J. 88, No. 2: TS145-146 (Aug., 1934).—A very brief discussion dealing with layout, materials of construction, exterior protection and cost.—A.P.-C.

Lubricants and Tests Related to Service Value. L. F. Jahnke. Paper Trade J. 99, No. 15: 23-26 (Oct. 11, 1934).—A brief general discussion.—A.P.-C.

Industrial Lubrication and Lubricants. O. L. Maag. Paper Ind. 16: 565 (Nov., 1934).—A very brief outline of the various types of lubricants suitable for different services.—A.P.-C.

Modern Methods of Boiler Water Treatment and Control. H. T. Fisher. Paper Maker & Brit. Paper Trade J. 88, No. 3: TS166-175 (Sept., 1934).—A review.—A.P.-C.

Progress in Power and Heat Operation. von Lassberg. Papier-Fabr. 31, No. 11: 167-79 (March 12, 1933). By means of numerous illustrations, the author shows the progress made in boiler design, turbines and auxilliary equipment.—J. F. O.

Power Requirements and Energy Economics in the Paper and Pulp Industry. Rudolf Mehlo. Papier-Fabr. 31, No. 34: 451-54 (Aug. 20, 1933). Use of high pressure steam in the pulp and paper industry.—J. F. O.

Dust and Smokeless Ash Removal from Hard Coal and Brown Coal Boiler Installations. Konrad Weiss. Zellstoff u. Papier 14, No. 9:363-64; No. 10:395-97 (Sept., Oct., 1934). Description of installation and cost of operation.—J. F. O.

Packing for Water, Gases, Air, Oil and Benzine. Hans Diegmann, Hannover. Wochbl. Papierfabr. 65, No. 32: 569-571; No. 38: 678-680 (Aug. 11, Sept. 22, 1934). Recommendations for the packing of pipe lines, etc. for water, gases, air, oil and benzine are given.—J. F. O.

Miscellaneous

The Consumption of Fresh Water in Paper Mills. W. Brecht. Papier-Fabr. 31, No. 11: 149-64 (March 12, 1933). From a review of the extensive literature on the subject, the author writes an exhaustive treatise, using numerous line diagrams and tables.—J. F. O.

The Further Growth of the Sack Paper and the Paper Sack Industry. R. A. Krauss, Wochbl. Papierfabr. 65, No. 40: 705-707 (Oct. 6, 1934). Numerous facts concerning the industry.—J. F. O.

Winding Phenomena of Paper. Paul Klemm. Wochbl. Papierfabr. 65, No. 47: 833-35; No. 48: 849-51 (Nov. 24, Dec. 1, 1934). An interesting discussion on what takes place when paper is wound up with special reference to the moisture content and the sizing of the paper. —J. F. O.

Separating and Classifying in the Paper Industry. N. Wunderlich. Papier-Fabr. 32, No. 37: 393-98; No. 41: 425-428 (Sept. 16, Oct. 14, 1934). The separating of floating materials from suspension takes place according to three methods of a combination of them, namely, filtration, sedimentation and floatation. Equations are worked out for the methods, the various apparatus using these methods, their efficient operation and the kind of stock most suited are all discussed in full.—J. F. O.

Meeting of the West Germany Section of the German Pulp and Paper Association, at Cologne, May 22, 1934. Papier-Fabr. 32, No. 25:296-98 (June 24, 1934). The papers read were, "Concerning the acid groups of pulp and fibrous materials," by Max Ludtke; "Possibilities of lowering the cost of power and its influence on the fixed costs in the paper industry," by Reinhold Sculze; "Felt Damage, especially through bacteria," by Johannes Bartsch.—J. F. O.

Progress in Colloid Chemistry. Annual Report for 1933. Rudolf Lorenz. Zellstoff u. Papier, 14, No. 4: 141-48 (April, 1934). Among the subjects discussed in this lengthy report are; films and threads and their ramifications, swelling of wood and wood fibers, water absorption of materials of cellulose, the fixation of materials on fibers, dissolving of rosin in alkali and rosin sizing, relation between the strength and the sizing of unbleached sulphite, and the swelling of animal size.—J. F. O.

Annual Meeting of the German Association of Pulp and Paper Engineers and Chemists for 1933. Papier-Fabr. 31, No. 51:685-93 (Dec. 17, 1933).—After the business part of the meeting was over, the following papers were given: "The colloidal chemical properties of spruce wood" by Schwalbe; "The German standard method for the testing of pulp" by von Possanner; "The evolution of the Benson boiler with special reference to its use in the pulp and paper industry" by Gleichmann; and "The analysis of swelling by means of moving pictures" by Kurt Hess.—J. F. O.

Technical Improvements in the Manufacture of Pulp, Ground Wood and Paper During the Year 1933. R. Trenschel. Zellstoff u. Papier, 14, No. 4:148-52; No. 5:200-06 (April, May, 1934).—Among the topics discussed are: methods of barking, in particular, steam exploding the bark from the wood; various systems for the circulation of the liquor in digesters; improvements in the

manufacture of sulphate pulp; new decomposition methods for wood, especially the method using dioxan and a catalyser; bleaching methods; recovery of alcohol from sulphite waste liquor; new pulp grinders, screens and thickeners; testing of ground wood. In the manufacture of paper; preparation of the stock for the beaters, methods for beater control, stock regulators, knotters, new ways for shaking the wet end of a paper machine, new types of press rolls and extractors, dryer felts and the control of drying, and machines for the finishing of paper. A very comprehensive bibliography accompanies the article. —J. F. O.

The Laboratory Investigation of Pitch Problems. S. R. H. Edge. World's Paper Trade Rev. 102:1184-1188, 1230-1232, 1262, 1264, 1300 (Oct. 19, 26, 1934); Pulp Paper Can. 36:21-24 (Jan., 1935).—Most of the rosin in pulp is contained in the minute medullary ray fibers. A method is described for evaluating tendency to pitch formation. Change in tendency to pitch formation in time is due mainly to oxidation. Hard water does not seem to be a contributory cause in pitch formation. Calcium salts of rosin acids are not essential to pitch formation. Elimination or considerable reduction of pitch trouble should be obtained by screening the bulk of the medullary-ray fibers out of the pulp, which is possible with a total loss in weight of only about 2 per cent.—A. P.-C.

Early Pulp and Paper Mills of the Pacific Coast. Ralph M. Snell and B. T. McBain. Paper Trade J. 99, No. 15:42-50 (Oct. 11, 1934).—Historical notes on paper making and the present pulp and paper mills in the Pacific Coast States.—A. P.-C.

United States Patents on Paper Making. Second Quarter, 1934. Clarence J. West. Paper Trade J. 99, No. 18:38-40 (Nov. 1, 1934).—A list in numerical sequence of patents relating to pulp and paper making issued at Washington during July, Aug. and Sept., 1934.—A. P.-C.

Technical Control in Pulp and Paper Manufacture. M. W. Phelps. Paper Trade J. 99, No. 17:51-54 (Oct. 25, 1934).—A general discussion of the functions of the modern technical control department.—A. P.-C.

Incompletely Solved Chemical Problems in the Pulp and Paper Industry. D. C. M. I. P. Papeterie 56: 1026, 1029, 1077-1081 (Oct. 10, 25, 1934).—A general discussion of some of the principal chemical problems of the pulp and paper industry.—A. P.-C.

Maintenance and Its Relation to the Technical Man. William Gibson. Paper Trade J. 99, No. 19:45-46 (Nov. 8, 1934).—A very brief discussion.—A. P.-C.

Chemical Control in Paper Manufacture. J. E. Minor. Paper Trade J. 99, No. 20:45-48 (Nov. 15, 1934). —A general discussion showing the function and importance of chemical tests in controlling paper manufacture.—A. P.-C.

Technical Controls in Book Paper Mills. W. K. Kidder. Paper Ind. 16:475-477(Oct., 1934).—A brief general discussion.—A. P.-C.

The Bulk of Paper and Its Effect in the Graphic Arts. D.C M.I.P. PAPETERIE 56:1022, 1025 (Oct. 10, 1934). —A brief discussion of the definition and measurement of the bulk of paper.

Preservation of Newspaper Records. B. W. Scribner. Paper Trade J. 99, No. 14:31-35 (Oct. 4, 1934).—Newspapers published in the United States from 1830 to 1900 were examined from the standpoint of the preservation of this form of record.—A. P.-C.

What Happens When Ink Meets Paper? Vincent S. Smith. Paper Industry 16:626 (Dec., 1934).—A brief explanation of the chief factors of paper quality that affect ink penetration.—A. P.-C.

Paper and the Printer. W. Davey. Pulp Paper Can. 36:14-15 (Jan., 1935).—A brief discussion of the importance of paper manufacturers keeping up with modern trends in order to furnish the printer with paper meeting the increasingly stringent requirements resulting from improvements and new developments in printing technic.—A. P.-C.

The formation of Fungus and Slime in the Manufacture of Paper and Its Raw Materials. W. Schmid. Papier-Fabr. 32, No. 41:430-32 (Oct. 14, 1934).—Slime is defined as a colloidal substance permeated with fibers, rosin, fillers and various kinds of micro-organisms. The sources for slime infection are given in order of their importance, and it is believed that a pH of 4.5 is the most optimum for the growth of slime. The most favorable temperature for slime growth is from 28° to 40°C. In conclusion, methods for the elimination of slime are given. —J. F. O.

Paper Machine Water. L. M. Booth. Paper Trade J. 100, No. 4:33-34 (Jan. 24, 1935).—A discussion showing the benefits to be derived by controlling water quality near the paper machine wire.—A. P.-C.

Sprayed Molten Metal Coatings. E. V. David. Paper Trade J. 99, No. 18;34-37 (Nov. 1, 1934).—A review of the merits of sprayed molten metal coatings, and more particularly of the Metalayer Process.—A. P.-C.

The Casting Problems of Stainless Steel. Ernest G. Swigert. Pacific Pulp Paper Ind. 8, No. 9:24-26 (Sept., 1934); Paper Trade J. 99, No. 19:43-45 (Nov. 8, 1934). —A brief discussion of the metallurgical and mechanical problems peculiar to stainless steel foundries.—A. P.-C.

The Influence of Our Patent System on the Industry of This Country. A. E. Goddin, Jr. World's Paper Trade Rev. 102: 1492, 1494, 1568, 1570, 1604-1609, 1664-1670 (Nov. 16, 30, 1934).—An address discussing how the paper industry in Great Britain has been assisted by the patent system.—A. P.-C.

United States Patents on Paper Making. Fourth Quarter, 1934. Clarence J. West. Paper Trade J. 100, No. 2:33-35 (Jan. 10, 1935).—A list in numerical sequence of patents relating to pulp and paper making issued at Washington during Oct., Nov. and Dec., 1934.—A. P.-C.

Manufacture of Boards for Finishing Textiles in the Eighteenth Century in France. Eugène Creveaux. Papier 37:999-1007 (Nov., 1934).—Historical notes.—A. P.-C.

Grading of Paper. John G. Strange. Paper Trade J. 99, No. 21:35-38 (Nov. 22, 1934).—An explanation of the work being carried out by the Central Grading Committee, Paper Industry Authority.—A. P.-C.

The Flatness of Paper. C. Cesconi. Papier 37: 1009-1022 (Dec., 1934).—A general discussion of the causes and prevention of the curling of paper.—A. P.-C.

Manufactured Weather As Applied to Paper Making. B. J. Bell. World's Paper Trade Rev. 102:1414, 1416 (Nov. 9, 1934).—A brief explanation of the effects of temperature and humidity changes on paper, more particularly as regards troubles caused in the printing plant.—A. P.-C.

Lagerloef Trading Co. Joins TAPPI

The Lagerloef Trading Company, 52 Vanderbilt avenue, New York, N. Y., has become a company member of the Technical Association of the Pulp and Paper Industry and will be represented by Hans Lagerloef, president.

The Lagerloef Trading Company are well known in the paper industry as importers of chemical and mechanical woodpulp from Finland.

IMPORTS OF PAPER AND PAPER STOCK

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING SEPTEMBER 14, 1935

CIGARETTE PAPER

H. H. Strauss, Lafayette, Havre, 75 cs.; Champagne Paper Corp., Lafayette, Havre, 619 cs.

WALL PAPER

W. H. S. Lloyd & Co., American Merchant, London, 12 bls.; S. K. Lonegren, Kungsholm, Gothenburg, 2 bxs.; S. K. Lonegren, Etna, Gefle, 18 bxs.; F. J. Emmerich, Laconia, Liverpool, 2 cs.; ———, Europa, Bremen, 1 cs.; Thomas — Pierson, Majestic, Southampton, 1 cs.

WALL BOARD

Treetex Corp., Sagoporack, Hernosand, 2001 bdls.; National City Bank, Sagoporack, Wallvik, 507 bdls.

NEWSPRINT

Jay Madden Corp., Columbus, Bremen, 322 rolls; Parsons & Whittemore, Inc., Kungsholm, Gothenburg, 210 rolls; H. G. Craig Co., Donpaco, Donnacona, 310 rolls; N. Y. Post, Hektor, Port Alfred, 297 rolls; Gilman Paper Co., Hektor, Port Alfred, 135 rolls; Perkins Goodwin & Co., A. Ballin, Hamburg, 304 rolls.

PRINTING PAPER

L. A. Consmiller, Columbus, Bremen, 2 cs.; C. Bruning, Cypria, Marseilles, 12 cs.; Senefelder Co., A. Ballin, Hamburg, 21 cs.

WRAPPING PAPER

———, Kungsholm, Gothenburg, 7 bls.; St. Regis Paper Co., Boschdyk, Rotterdam, 4 rolls; Wilkinson Bros., Co., Boschdyk, Rotterdam, 21 bls.

KRAFT PAPER

Arkell Safety Bag Co., Kungsholm, Gothenburg, 63 rolls.

PACKING PAPER

Chas. Happel, Boschdyk, Rotterdam, 8 cs.

FILTER PAPER

H. Reeve Angel & Co., Inc., American Merchant, London, 19 cs.

FILTER COMPOUND

H. Reifenberg, A. Ballin, Hamburg, 160 cs.

DRAWING PAPER

Keuffel & Esser Co., American Merchant, London, 1 cs.

BRISTOL BOARDS

Keuffel & Esser Co., American Merchant, London, 1cs.

LITHO PAPER

Senefelder Co., Nako Maru, Canton, 20 cs.

METAL COATED PAPER

K. Pauli Co., Columbus, Bremen, 33 cs.

SURFACE COATED PAPER

L. A. Consmiller, Columbus, Bremen, 24 cs.; Gevaert Co. of America, Pennland, Antwerp, 26 cs.; Chas. Happel, St. Louis, Hamburg, 31 cs.

BASIC PAPER

———, Columbus, Bremen, 27 cs.; Dingelstedt & Co., Columbus, Bremen, 19 cs.; Globe Shipping Co., Europa, Bremen, 25 cs.

PHOTO PAPER

J. J. Gavin, Majestic, Southampton, 4 cs.

TRACING PAPER AND CLOTH

C. Bruning Co., Columbus, Bremen, 33 cs.

DECALCOMANIAS

Sellers Transportation Co., Europa, Bremen, 20 cs.

TRANSFER PICTURES

Rohner Gehrig & Co., Europa, Bremen, 15 cs.

TRANSFER PAPER

Hansel Bruckman & Lorbacher, A. Ballin, Hamburg, 30 cs.

TISSUE PAPER

J. Romer, Nako Maru, Kobe, 8 cs.

PAPER BAGS

J. B. Mast & Co., Conti di Savoia, Genoa, 8 cs.

PASTE BOARD

Phoenix Shipping Co., A. Ballin, Hamburg, 20 bls.; ———, A. Ballin, Hamburg, 122 cs.

CARD BOARD

American Express Co., A. Ballin, Hamburg, 50 cs.

STRAW BOARD

———, Veendam, Rotterdam, 940 bdls.

PAPER TUBES

———, A. Ballin, Hamburg, 67 pkgs.

MISCELLANEOUS PAPER

Japan Paper Co., A. Maersk, Kobe, 17 cs.; W. A. Swan, Hoegh Merchant, Kobe, 11 cs.; H. Reeve Angel & Co., Inc., Kungsholm, Gothenburg, 111 rolls; Lunham & Reeve, Inc., Kungsholm, Gothenburg, 123 bls.; National Pulp & Paper Co., Inc., Kungsholm, Gothenburg, 161 bls., 2641 rolls, 411 bdls.; M. M. Cohen, Kungsholm, Gothenburg, 60 rolls, 40 bls.; Chase National Bank, Kungsholm, Gothenburg, 211 rolls; Westchester Paper Co., Inc., Kungsholm, Gothenburg, 9 bls.; The Borregaard Co., Inc., Kungsholm, Gothenburg, 190 pkgs, 171 bls., 394 rolls; Blauvelt Wiley Paper Manfg. Co., Kungsholm, Gothenburg, 26 rolls, 5 bls.; ———, Kungsholm, Gothenburg, 703 rolls, 66 pkgs.; F. L. Kramer & Co., Kungsholm, Gothenburg, 42 rolls; E. H. Seargent & Co., Kungsholm, Gothenburg, 1 cs.; Iwai & Co., Nako Maru, Kobe, 2 cs.; C. F. Lamalle, Lafayette, Havre, 7 pkgs.; Almo Trading & Importing Co., Lafayette, Havre, 30 cs.; Jay Madden Corp., A. Ballin, Hamburg, 25 bls., 1 cs.; Japan Paper Co., Tokai Maru, Kobe, 32 cs.

RAGS, BAGGINGS, ETC.

Globe Sanitary Rag Co., Hoegh Merchant, Kobe, 60 bls. rags; New England Waste Co., Hoegh Merchant, Kobe, 200 bls. cotton waste; Banco Coml. Italiane Trust Co.,

American Merchant, London, 70 bls. paper stock, 162 bls. rags; ———, American Shipper, Manchester, 47 bls. cotton waste; Darmstadt Scott & Courtney, Boschdyk, Rotterdam, 114 bls. bagging; E. J. Keller Co., Inc., Gitano, ———, 252 bls. rags; ———, Excelsior, Malaga, 62 bls. rags; S. Birkenstein & Sons, Excelsior, Barcelona, 118 bls. bagging; ———, Excelsior Barcelona, 629 bls. rags, 50 bls. linsey garments; Katzenstein & Keene, Inc., Excelsior, Barcelona, 178 bls. rags; E. J. Keller Co., Inc., Excelsior, ———, 171 bls. bagging; E. J. Keller Co., Inc., Black Tern, ———, 175 bls. rags; Van Oppen & Co., Black Tern, Rotterdam, 76 bls. bagging; Sheffler Merchandise Co., Black Tern, Antwerp, 20 bls. cotton waste; N. Schwab & Son, Black Tern, Antwerp, 65 bls. cotton waste; Irving Trust Co., Black Tern, Antwerp, 66 bls. bagging; Royal Manfg. Co., Black Tern, Antwerp, 114 bls. cotton waste; Manufacturers Trust Co., Pr. Polk, Bombay, 349 bls cotton waste; E. J. Keller Co., Inc., Pr. Polk, ———, 105 bls. rags; E. J. Keller, Co., Inc., Cypria, ———, 310 bls paper stock; Chase National Bank, Cypria, Barcelona, 71 bls. bagging; Bank of N. Y. Trust Co., Cypria, Barcelona, 171 bls. old cottons, 41 bls tares; Bank of N. Y. Trust Co., Cypria, Valencia, 201 bls. rags.; Castle & Overton, Inc., Murjek, Buenos Ayres, 279 bls. old cottons; Castle & Overton, Inc., Murjek, Buenos Ayres, 56 bls bagging, 16 bls. old linens; Castle & Overton, Inc., Murjek, Buenos Ayres, 29 bls. new cuttings; Loumar Textile By Products Co., Sagoporack, Gdynia, 61 bls. jute waste; Castle & Overton, Inc., Collamer, Havre, 29 bls. rags; G. W. Millar & Co., Inc., Collamer, Havre, 164 bls. rags; Burton Webbing Co., Collamer, Dunkirk, 61 bls. cotton waste; Darmstadt Scott & Courtney, Collamer, Dunkirk, 55 bls. jute waste; Manufacturers Trust Co., A. Ballin, Hamburg, 173 bls. cotton waste; E. J. Keller Co., Inc., Indep. Hall, ———, 302 bls. paper stock; E. J. Keller Co., Inc., Exeter, ———, 131 bls. paper stock; Windsor & Co., Tokai Maru, Osaka, 50 bls. rags; O'Brien Padawer Co., Tokai Maru, Osaka, 100 bls. cotton waste.

HIDE GLUE

———, A. Ballin, Hamburg, 10 bags; ———, Conti Grande, Trieste, 350 bags.

CASEIN

———, A. Ballin, Hamburg, 70 bags.

OLD ROPE

Manufacturers Trust Co., Veendam, Rotterdam, 50 coils; Manufacturers Trust Co., Boschdyk, Rotterdam, 54 coils; E. J. Keller Co., Inc., Gitano, ———, 90 coils.

WOOD PULP

Johaneson Wales & Sparre, Inc., Kungsholm, Guthenburg, 127 bls. sulphite; Johaneson, Wales & Sparre, Inc., Kungsholm, Gothenburg, 150 bls. sulphate; Johaneson Wales & Sparre, Inc., Kungsholm, Gothenburg, 748 bls. kraft soda pulp; J. Andersen & Co., Kungsholm, Gothenburg, 250 bls. sulphite; Price & Pierce, Ltd., Etna, Orviken, 450 bls. chemical pulp, 75 tons; Price & Pierce, Ltd., Etna, Hernosand, 10,950 bls. sulphate, 1,854 tons; Price & Pierce, Ltd., Etna Hernosand, 600 bls. sulphite, 101 tons; Perkins Goodwin & Co., Etna, Sundsvall, 300 bls. sulphite, 50 tons; Perkins Goodwin & Co., Etna, Sundsvall, 600 bls. sulphate, 100 tons; Pagel Horton & Co., Inc., Etna, Gefle, 250 bls. sulphite, 50 tons; Pagel Horton & Co., Inc., Etna, Gefle, 750 bls. sulphate 150 tons; Stora Kopparberg Corp., Etna, Gefle, 585 bls. dry pulp, 118 tons; ———, Etna, Kopmanholmen, 153 bls. chemical pulp; Bulkley Dunton & Co., Etna, ———, 1000 bls. wood pulp; Bulkley Dunton & Co., Black Tern, ——— 870 bls. wood pulp; Price & Pierce, Ltd., Sagoporack, Wallvik, 600 bls. sulphite, 100 tons; E. J. Keller Co., Inc., Sagoporack, ———, 336 bls. wood pulp, 50 tons; ———, Sagoporack, Gdynia, 324 bls. wood pulp, 50 tons; Bank of N. Y. Trust Co., A. Ballin, Hamburg, 140 bls. wood pulp, 28 tons.

WOOD PULP BOARDS

H. Fuchs & Son, Kungsholm, Gothenburg, 93 crates; Jay Madden Corp., Sagoporack, Wiborg, 16 bls.

ALBANY IMPORTS

WEEK ENDING SEPTEMBER 14, 1935

Price & Pierce, Ltd., Etna, Orviken, 1,425 bls. chemical pulp, 241 tons; Pagel Horton & Co., Inc., Etna, Orviken, 300 bls. sulphite, 50 tons; Pagel Horton & Co., Inc., Etna, Gefle, 1500 bls. sulphite, 304 tons; Pagel Horton & Co., Inc., Etna Kopmanholmen, 287 bls. sulphite; ———, Etna, Kopmanholmen, 1,377 bls. chemical pulp; Perkins Goodwin & Co., Etna, Sundsvall, 2400 bls. sulphite, 400 tons; Bulkley Dunton & Co., Dalhem, ———, 2100 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING SEPTEMBER 14, 1935

National City Bank, A. Maersk, Kobe, 167 bls. rags; T. Robertson & Son, A. Maersk, Shanghai, 88 bls. cotton waste; Beacon Wiper Supply Co., Hoegh Merchant, Kobe, 73 bls. rags; ———, Laconia, Liverpool, 292 bags hide cuttings; G. F. Malcolm, Inc., Laconia, Liverpool, 18 cs. tissue paper; ———, Boschdyk, Rotterdam, 79 rolls straw boards; E. Butterworth & Co., Inc., Excelsior, Piraeus, 43 bls. rags; E. J. Keller Co., Inc., Artigas, ———, 73 bls. bagging; Bulkley Dunton & Co., Kelkheim, ———, 1000 bls. wood pulp; Bulkley Dunton & Co., Karpfanger, ———, 5,750 bls wood pulp.

PHILADELPHIA IMPORTS

WEEK ENDING SEPTEMBER 14, 1935

American Cotton Products Co., A. Maersk, Kobe, 60 bls. cotton waste; O. Smith & Sons, A. Maersk, Shanghai, 50 bls. cotton waste; ———, A. Maersk, Shanghai, 200 bls. cotton waste; Union Waste Co., Hoegh Merchant, Kobe, 75 bls. rags; E. Butterworth & Co., Inc., Boschdyk, Rotterdam, 100 bls. rags; ———, Boschdyk, Rotterdam, 10 rolls, 25 cs. basic board; Castle & Overton, Inc., Boschdyk, Rotterdam, 53 bls. rags; Philadelphia National Bank, Boschdyk, Rotterdam, 7 bls. rags; F. Whitaker & Co., Boschdyk, Rotterdam, 11 bls. bagging; E. J. Keller Co., Inc., Boschdyk, ———, 101 bls. rags; E. J. Keller Co., Inc., Excelsior, ———, 76 bls. rags; National Vulcanized Fibre Co., Excelsior, Barcelona, 201 bls. rags; Bank of N. Y. Trust Co., Cypria, Valencia, 290 bls. rags; Stora Kopparberg, Corp., Sagoporack, Gefle, 800 bls. wood pulp, 162 tons; Pagel Horton & Co., Inc., Sagoporack, Husum, 6,150 bls. sulphate, 1000 tons; Price — Pierce, Ltd., Sagoporack, Orviken, 1,050 bls. chemical pulp, 177 tons; E. W. Twitchell, Inc., Sagoporack, Copenhagen, 22 rolls wrapping paper; F. L. Smidth & Co., Sagoporack, Copenhagen, 150 bls. paper bags; Castle & Overton, Inc., Collamer, Havre, 425 bls. rags; ———, Collamer, Havre, 183 bls. rags; De Sio Bros., Collamer, Havre, 20 bls. rags; American Sanitary Rag Co., Collamer, Havre, 35 bls. rags; The Lang Co., Collamer, Havre, 333 bls. rags; Castle & Overton, Inc., Collamer, Dunkirk, 253 bls. rags; E. J. Keller Co., Inc., Collamer, ———, 281 bls. rags; E. J. Keller Co., Inc., Indep. Hall, ———, 318 bls. paper stock.

WILMINGTON IMPORTS

WEEK ENDING SEPTEMBER 14, 1935

Pagel Horton & Co., Inc., Sagoporack, Gefle, 5000 bls. sulphite, 508 tons; Price & Pierce, Ltd., Sagoporack, Orviken, 3,600 bls. chemical pulp, 609 tons; ———, Sagoporack, Horneborg, 1,224 bls. chemical pulp, 200 tons; Per-

(Continued on page 47)

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, September 18, 1935.

Conditions in the local paper market are improving steadily. Demand for the various grades of paper is expanding and inquiries for future requirements are more numerous than of late. Sales forces of the leading paper organizations are inaugurating a strenuous Autumn campaign. Prices are generally steady and unchanged.

The undertone of the news print paper market is stronger. Total production in the United States, Canada, Newfoundland and Mexico for August amounted to 342,394 tons, according to statistics gathered by the News Print Service Bureau. Figures for the first eight months show an increased North American output of 41,838 tons.

Steadiness prevails in the fine paper market. Demand for book, cover, writing and ledger papers is fairly persistent. Prices are firmer. Tissues are moving freely. The coarse paper market is displaying strength and the outlook for the coming months is bright. There are also signs of greater activity in the paper board market.

Mechanical Pulp

The ground wood pulp market is stronger and demand for both imported and domestic mechanical pulp is slightly better. Manufacturing operations in this country and abroad are maintained in adequate volume to take care of current requirements. Prices are generally holding to formerly quoted levels.

Chemical Pulp

Business in the chemical pulp market is fairly satisfactory. Demand for kraft pulp, in particular, is brisk. With offerings limited, quotations are decidedly firm. Imported kraft No. 1 is quoted at from $1.70 to $1.80 and No. 2 at from $1.60 to $1.70, on dock, Atlantic ports. Domestic kraft pulp prices continue steady.

Old Rope and Bagging

The old rope market is moderately active. Demand for both domestic and imported old manila rope is restricted. Small mixed rope is rather quiet. No radical price changes have been reported. The bagging market is displaying strength. Gunny and scrap bagging are holding up well. Roofing bagging is in excellent request.

Rags

Paper mill demand for the various grades of domestic rags is growing. New cotton rags are in good request, both for domestic and foreign consumption. It is reported that $6.25 has been paid for No. 1 white shirt cuttings for export. The imported rag market is sharing the general improvement.

Waste Paper

The paper stock market is beginning to show more activity. Board mill demand for the lower grades of waste paper is better and prices are firmer. No. 1 white news is now offered at from $1.30 to $1.35. Other grades are showing strength, including hard and soft white shavings and white envelope cuttings.

Twine

Demand for the various varieties of twine is well maintained and the outlook for the closing months of the year is promising. Supplies are moving into consumption in good volume. The recently advanced quotations on all grades of hard and soft fibers are still in force.

IMPORTS OF PAPER AND PAPER STOCK

(Continued from page 46)

kins Goodwin & Co., Sagoporack, Gdynia, 388 bls. sulphite, 60 tons.

BALTIMORE IMPORTS

WEEK ENDING SEPTEMBER 14, 1935

Sherman Bros., Nako Maru, Kobe, 115 bls. rags; Castle & Overton, Inc., Boschdyk, Rotterdam, 750 bls. wood pulp; National City Bank, Boschdyk, Rotterdam, 121 bls. rags; Congoleum Nairn Co., Excelsior, Valencia, 186 bls. rags; Congoleum Nairn Co., Black Tern, Rotterdam, 260 bls. rags; Congoleum Nairn Co., Black Tern, Antwerp, 424 bls. rags; E. Butterworth & Co., Inc., Black Tern, Antwerp, 93 bls. bagging; Bulkley Dunton & Co., Simon von Utrecht, ———, 3,375 bls. wood pulp; Bulkley Dunton & Co., Kelkheim, ———, 4,175 bls. wood pulp; Bulkley Dunton & Co., City of Norfolk, ———, 1000 bls. wood pulp.

NEWPORT NEWS IMPORTS

WEEK ENDING SEPTEMBER 14, 1935

Bulkley Dunton & Co., Stureholm, ———, 1,250 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING SEPTEMBER 14, 1935

National City Bank, A. Maersk, Kobe, 400 bls. bagging; Bank of N. Y. Trust Co., Black Tern, Rotterdam, 87 bls. bagging; Bank of N. Y. Trust Co., Black Tern, Antwerp, 194 bls. bagging.

MONTREAL IMPORTS

WEEK ENDING SEPTEMBER 14, 1935

Gottesman & Co., Inc., Idefjord, Sweden, 16,300 bls. wood pulp; Gottesman & Co., Inc., Goslar, Czecho-Slovakia, 1,935 bls. wood pulp; Gottesman & Co., Inc., Beaverburn, Czecho-Slovakia, 5,336 bls. wood pulp.

Specialty Paper Co. Employees Insured

The Specialty Paper Company, of Dayton, Ohio, has acquired a group life insurance policy involving $150,000 for the protection of 131 employees, each worker being eligible to protection in amounts ranging from $1,000 to $3,000, according to rank.

The policy, issued by the Prudential Insurance Company of America, is of the contributory type, the employees themselves paying a part of the premium and the employing company assuming the remainder of the expense.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, September 18, 1935.

BLANC FIXE.—The position of the blanc fixe market is practically unchanged. Prices are holding to schedule. The pulp is quoted at from $42.50 to $45 per ton, in bulk; while the powder is selling at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER.—Some improvement transpired in the bleaching powder market. Demand for this product is more active than of late. Prices are steady to firm. Bleaching powder is quoted at from $1.90 to $2.15 per 100 pounds, in drums, at works.

CASEIN.—The casein market is firm. Domestic standard ground is quoted at 11¼ and finely ground at 11¾; French standard ground at 12¼ and finely ground at 12¾; Argentine standard ground at 12½ and finely ground at 13 cents per pound, all in bags, car lot quantities.

CAUSTIC SODA.—Steadiness prevails in the caustic soda market. The contract movement is seasonal. Prices are unchanged. Solid caustic soda is quoted at from $2.60 to $3.10; while the flake and ground are selling at from $3 to $3.05 per 100 pounds, in drums, at works.

CHINA CLAY.—The china clay market is fairly active. Supplies are going forward into consumption freely. Imported china clay is quoted at from $13.50 to $21 per ton, ship side; while domestic paper making clay is selling at from $6.50 to $12 per ton, at mine.

CHLORINE.—Conditions in the chlorine market are improving. Demand from the paper mills is persistent. Prices are holding to schedule. Chlorine is quoted at from $2 to $2.40 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is displaying strength. Paper making gum rosin is quoted at $4.10 and wood rosin at $4.20 per 280 pounds, gross weight, in barrels, at Savannah. Seventy per cent rosin size is selling at $2.48 per 100 pounds, in tank cars, at works.

SALT CAKE.—Demand for salt cake is fairly brisk. Prices are steady and unchanged. Salt cake is quoted at from $12 to $13; and chrome salt cake at from $11 to $12 per ton, at works. Imported salt cake is selling at from $12 to $13 per ton, ship side.

SODA ASH.—The soda ash market is exhibiting strength. While demand is moderately active, the future outlook is promising. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.05; in bags, $1.20; and in barrels, $1.50.

STARCH.—Business in the starch market is beginning to improve with the wane of summer. Contract shipments are going forward regularly. Special paper making starch is quoted at $3.59 per 100 pounds, in bags; and at $3.86 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—The sulphate of alumina market is more active. Prices continue steady to firm. Commercial grades are quoted at from $1.35 to $1.50; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is steady. Sulphur is quoted at $18 per long ton on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton on any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

TALC.—Most of the business transacted in the talc market during the past week was along routine lines. Domestic talc is still quoted at from $16 to $18 per ton, at eastern mines; while imported talc is selling at from $23 to $30 per ton, on dock.

Market Quotations

Paper

(F. o. b. Mill)

Ledgers	6.50	@	—
Bonds	6.00	@	—
Index	6.00	@	—
Writings—			
Extra Superfine	6.50	@	—
Superfine	6.25	@	—
Tub sized	5.75	@	—
Engine sized	5.50	@	—
Book, Cased—			
S. & S. C.	5.35	@	5.75
S. & S. C. Litho.	5.60	@	6.00
M. F.	5.10	@	5.50
Coated and Enamel	5.90	@	6.55
Coated Litho	5.90	@	6.55
Tissues—Per Ream—			
White No. 1	.82½	@	.85
White No. 2	.67½	@	—
Anti-Tarnish M. G. only	1.00	@	—
Colored	.85	@	—
Kraft	.70	@	—
Manila	.67½	@	.70
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	4.00	@	4.50
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.50	@	3.50
Glassine—			
Bleached	.11	@	—
Unbleached	.09	@	—

(The following Quotations are Delivered New York)

News, per ton—			
Roll, contract	40.00	@	—
Rolls, spot	40.00	@	—
Sheets	45.00	@	—
Kraft—			
No. 1 Northern	4.12½	@	4.75
Standard	4.00	@	—
Southern	3.87½	@	—
Boards—per ton—			
News	32.50	@	35.00
Chip	32.50	@	35.00
Sgl. Mla. Ll. Chip	45.00	@	47.50
Jute Lined Chip	45.00	@	47.50
White Patent Coated	55.00	@	57.50
Binders Boards	67.00	@	75.00

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—		
Moist	21.00	@22.00
Dry	21.00	@22.00
(F. o. b. Mill)		
No. 1 Domestic and Canadian	18.00	@24.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Division 1	2.60	@	—*
Division 2	2.55	@	—*
Division 3	2.50	@	—*
Prime Qualities—			
Class 1. All Prime Easy Bleaching	2.05	@	—*
Other Than Easy Bleaching—			
Class 2. Higher than Standard	2.00	@	—*
Class 3, Standard	1.95	@	—*
Class 4, Lower than Standard	1.90	@	—*
(On Dock, Atlantic Ports)			
Kraft No. 1	1.70	@	1.80
Kraft No. 2	1.60	@	1.70
(F. o. b. Pulp Mill)			
Kraft Domestic	1.70	@	2.35
(Delivered)			
Soda Bleached	2.50	@	—

* Add 60 Cents per short ton, dock charges, for Albany; $2.00 for Lake Ports East and $3.00 for Lake Ports West of Mackinac Straits.

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.00	@	6.25
Silesias No. 1	4.50	@	4.75
New Unbleached	6.50	@	6.75
New Soft Blacks	3.00	@	3.25
Blue Overall	4.25	@	4.50
Fancy	2.50	@	2.75
Washables	1.75	@	2.00
Mixed Khaki Cuttings	3.00	@	3.25
O. D. Khaki Cuttings	3.75	@	4.00
Men's Corduroy	1.50	@	1.75
New Mixed Blacks	2.50	@	2.75

Old Rags

White, No. 1—			
Repacked	3.00	@	3.50
Miscellaneous	2.75	@	3.25
White, No. 2—			
Repacked	1.75	@	2.25
Miscellaneous	1.50	@	1.75
Thirds and Blues—			
Repacked	1.50	@	1.75
Miscellaneous	1.25	@	1.50
Black Stockings	2.50	@	3.00
Roofing Rags—			
No. 1	1.55	@	1.60
No. 2	1.30	@	1.35
No. 3	.95	@	1.00
No. 4	.95	@	1.00
No. 5A	.90	@	1.00

Foreign Rags

New Rags

New Dark Cuttings	1.75	@	1.85
New Mixed Cuttings	1.80	@	1.90
New Light Silesias	3.75	@	4.00
Light Flannelettes	3.75	@	4.00
Unbleached Cuttings	6.50	@	6.75
New White Cuttings	6.50	@	6.75
New Light Oxfords	3.25	@	3.50
New Light Prints	2.75	@	3.00

Old Rags

No. 1 White Linens	7.50	@	8.00
No. 2 White Linens	6.50	@	7.00
No. 3 White Linens	4.50	@	5.00
No. 4 White Linens	2.25	@	2.50
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.75
No. 3 White Cotton	2.50	@	2.75
No. 4 White Cotton	1.90	@	2.15
Extra Light Prints	2.00	@	2.25
Ord. Light Prints	1.75	@	1.85
Med. Light Prints	1.55	@	1.65
Dutch Blue Cottons	1.75	@	1.85
French Blue Linens	2.30	@	2.40
German Blue Linens	2.15	@	2.25
German Blue Cottons	1.70	@	1.80
Checks and Blues	1.30	@	1.40
Linsey Garments	1.95	@	2.05
Dark Cottons	1.50	@	1.60
Old Shopperies	1.00	@	1.05
New Shopperies	.95	@	1.05
French Blues	1.70	@	1.80

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.70	@	1.80
Domestic	1.50	@	1.60
Wool Tares, light	1.65	@	1.70
Wool Tares, heavy	1.75	@	1.80
Bright Bagging	1.65	@	1.70
Manila Rope—			
Foreign	1.85	@	2.00
Domestic	1.75	@	2.00
Small Mixed Rope	1.10	@	1.35
New Burlap Cut	2.00	@	2.25
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.45	@	2.55
Ordinary Hard White No. 1	2.10	@	2.15
Hard White No. 2	1.90	@	2.00
Soft White No. 1	1.70	@	1.80
Flat Stock—			
Stitchless	.65	@	.75
Over issue Mag	.65	@	.75
Solid Flat Book	.45	@	.50
Crumpled No. 1	.35	@	.40
Solid Book Ledger	1.50	@	1.65
Ledger Stock	1.00	@	1.10
New B. B. Chips	.30	@	.35
Manilas—			
New Env. Cut	1.70	@	1.80
New Cuttings	1.35	@	1.45
Print	Nominal		
Bogus Wrapper	.40	@	.50
Container	Nominal		
Old Kraft Machine—			
Compressed bales	1.10	@	1.20
News—			
No. 1 White News	1.30	@	1.35
Strictly Overissue	.60	@	.65
Strictly Folded	.40	@	.42½
No. 1 Mixed Paper	.30	@	.32½

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Söderhamn, Sweden
CELLULOSEFABRIKS A.-G.
Bratislava, Czecho-Slovakei
SVANÖ AKTIEBOLAG
Svanö, Sweden

Twines
(F. o. b. Mill)

Coarse Polished—			
India	.11¼	@	.14¼
Belg. White Hemp	.12¼	@	.16¼
India Compress	.12¾	@	.12¾
Fine Polished—			
Fine India	.19½	@	.21½
Special	.17½	@	.49½
B. C.	.26	@	.28
Unpolished—			
Box	.10½	@	.11
Paper Makers	.07½	@	.12½
Tube Rope	.08½	@	.13½
Wall Paper	.09½	@	.13
Wrapping	.13	@	.19
Special	.13	@	.13½
Soft Fiber Rope	.10¼	@	.11¼

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.12	@	.50
Water Marked Sulphite Bond	.06¾	@	.11
Sulphite Bond	.05½	@	.11
Superfine Writing	.18	@	.24
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07	@	.12
Coated Label	.07	@	.08½
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.03¼	@	.03¾
No. 1 Kraft	4.75	@	5.00
Southern Kraft	3.88	@	4.25
No. 2 Kraft	3.88	@	4.25
Wood Tag Boards	.04¼	@	.06¼
Sulphite Screenings	.03	@	.03¼
Manila Tissue	.05¾	@	.07
White Tissue	.07	@	.09

(Delivered Central Territory)

News, per ton—			
Rolls, contract	41.00	@	—
Sheets, open	46.00	@	48.50
Boards, per ton—			
Plain Chip	46.50	@	—
Solid News	50.00	@	—
Manila Lined Chip	55.00	@	—
Patent Coated	65.00	@	—
Container Lined—			
85 Test, per 1000 sq. ft.			1.70
100 Test, per 1000 sq. ft.			1.85

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings	1.70	@	2.00
No. 1 Hard White	1.40	@	1.65
No. 1 Soft White	1.25	@	1.50
Ledger & Writings	.70	@	.80
Solid Books	.60	@	.70
Blanks	1.00	@	1.05
Krafts	.80	@	.90
New Kraft Cuts	1.20	@	1.30
Manila Env. Cuts	1.25	@	1.30
Ex. No. 1 Manila	.90	@	1.00
Print Manila	.40	@	.50
Overissue News	.40	@	.45
Old Newspapers—			
No. 1	.30	@	.35
No. 1 Mixed Paper	.25	@	.30
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(Delivered Philadelphia)

Bonds	.05-9/10	@	.38
Ledgers	.06-9/10	@	.40
Writings—			
Fine No. 3	.05	@	.06
Superfine	.10	@	.12
Extra Fine	.15	@	.26
Fine	.15	@	.26
Fine, No. 2	.10	@	.25
Book, M. F.	.05¾	@	.06¼
Book, S. S. & C.	.05½	@	.07½
Book, Coated	.06½	@	.09
Coated Lithograph	.06¾	@	.08½
Label	.07	@	.11
No. 1 Jute Manila	6.25	@	—
Manila Sul., No. 1	5.25	@	—
Manila No. 2	3.75	@	—
No. 1 Kraft	5.00	@	—
Southern Kraft	4.75	@	—
Common Bogus	.03	@	—
News Print Rolls	40.00	@	—
Straw Board	40.00	@	45.00
News Board	40.00	@	—
Chip Board	37.50	@	—
Wood Pulp Board	70.00	@	85.00
Binder Boards—			
No. 1, per ton	75.00	@	80.00
No. 2, per ton	70.00	@	75.00
Carload lots	65.00	@	70.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.40	@	1.75
Best Tarred, 3 ply	2.00	@	2.25

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1.	.03½	@	.04
New White, No. 2.	.02½	@	.04
Light Silesias	.02½	@	.03
Silesias, No. 1	.03	@	.03½
Black Silesias, soft.	.02½	@	.03
New Unbleached	.05	@	.05½
Washable, No. 1	.01½	@	.02
Blue Overall	.03½	@	.04
Cottons—According to grades—			
Washable, No. 2	.02½	@	.03
New Blue	.01½	@	.03
Fancy	.01½	@	.03
New Black Soft	.02	@	.04
New Light Seconds	.01½	@	.02
New Dark Seconds	1.50	@	1.75
Khaki Cuttings—			
No. 1 O. D.	.03	@	.04
No. 2 Mixed	.03	@	.04
Corduroy	.02	@	.03
New Canvas	.03½	@	.04½
New Black Mixed	.02½	@	.03½

Domestic Rags (Old)

White No. 1—			
Repacked	2.50	@	3.50
Miscellaneous	1.75	@	2.25
M. G.	3.00	@	3.75
Thirds and Blues—			
Miscellaneous	1.00	@	1.50
Repacked	1.50	@	2.00
Black Stockings (Export)	2.00	@	3.50
Roofing Stock—			
Foreign No. 1	.50	@	.75
Repacked	.70	@	.85

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.25	@	1.50
Domestic	1.50	@	1.75
Manila Rope	2.00	@	2.25
Sisal Rope	1.25	@	1.50
Mixed Rope	1.00	@	1.10
Scrap Burlaps—			
No. 1	1.25	@	1.50
No. 2	.80	@	1.00
Wool Tares, heavy	2.75	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.25	@	2.50
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	1.90	@	2.00
No. 1 Soft White	1.80	@	1.85
No. 2 Soft White	1.25	@	1.30
No. 1 Mixed	—	@	.75
Solid Ledger Stock	1.50	@	1.60
Writing Paper	1.00	@	1.10
No. 1 Books, heavy	.55	@	.60
No. 1 New Manila	1.50	@	—
Print Manila	.50	@	.60
Container Manila	—	@	.50
Old Kraft	1.00	@	—
No. 1 Mixed Paper	—	@	.30
Straw Board Chip	.40	@	—
Binders Board Chip	.40	@	—
Corrugated Board	.55	@	—
Overissue News	.60	@	—
Old Newspapers	.40	@	—

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.06	@	.12½
Rag Content	.12	@	.30
All Rag	.36	@	.52½
Bonds—			
Sulphite	.07¼	@	.11
Rag Content	.12	@	.30
All Rag	.36	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.06	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¼	@	.06½
Manila, Sul. No. 2	.03¾	@	.04½
No. 1 Kraft	.04¾	@	.05
No. 2 Kraft	.04½	@	.04¾
(F. o. b. Boston)			
Southern Kraft	.03¾	@	.04½
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots)			
Common Bogus	.02	@	.02¾
(Delivered New England points)			
News Print Rolls	39.50	@	—
Straw Board, rolls.009	—	@	35.00
Straw Board in Sheets, basis 35s to 70s	—	@	40.00
Filled News Board	40.00	@	45.00
Chip Board	37.50	@	40.00
Chip Board (Creasing)	37.50	@	40.00
Single Manila Lined Chip	47.50	@	52.50
Single White, Patent Coated News Board (Bender)	55.00	@	65.00
Wood Pulp Board	70.00	@	75.00
Binder Boards (Standard Grade)	67.00	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.00	@	2.20
No. 1 Soft White	1.75	@	1.90
No. 2 Mixed	.75	@	.80
Solid Ledger Books	1.40	@	1.50
Overissue Ledger Stock	1.15	@	1.30
Mixed Ledgers	.85	@	.90
No. 1 Books, heavy	.55	@	.65
No. 1 Books, light	.50	@	.60
Crumpled Stitchless Book Stock	.50	@	.60
Manila Env. Cuttings	1.30	@	1.40
No. 1 Old Manila	.60	@	.65
White Blank News	1.25	@	1.30
No. 1 Kraft	1.00	@	1.05
Mixed Papers	.25	@	.30
Print Manila	.50	@	.60
Container Manilas	.27½	@	—
Old Newspapers	.27½	@	.30
Overissue News	—	@	.35
Box Board Chips	—	@	.25
Corrugated Boxes	.35	@	.37½
Screening Wrappers	.40	@	.45

Bagging
(F. o. b. Boston)

Manila Rope—			
Foreign	1.80	@	1.90
Domestic	1.50	@	1.75
Transmission Rope	.90	@	1.00
Jute Rope	1.50	@	1.60
Jute Carpet Threads	.65	@	.70
Gunny No. 1—			
Foreign	1.85	@	—
Domestic	1.50	@	—
Bleachery Burlap	4.00	@	4.50
Scrap Burlap—			
Foreign	1.75	@	1.85
Domestic	1.60	@	—
Scrap Sisal	1.30	@	1.35
Scrap Sisal for Shredding	1.35	@	1.50
Wool Tares, heavy	1.75	@	1.85
New Burlap Cuttings	1.75	@	1.90
Australian Wool Pouches	2.50	@	2.75
Heavy Baling Bagging	1.75	@	2.00
Paper Mill Bagging	1.25	@	—
Bagging No. 2	.90	@	.95

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.01¾	@	.02
New White No. 1	.06	@	.06¼
New White No. 2	.04	@	.04¼
Silesias No. 1	.04¼	@	.04½
New Black Silesias	.02½	@	.03
Soft Unbleached	.06½	@	.06¾
Blue Cheviot	—	@	4.65
Fancy	.0195	@	.021
Washable	.0165	@	.0170
Cottons—According to grades—			
Blue Overalls	.04½	@	.04¾
New Black, soft	.04	@	.04¾
Khaki Cuttings	.03½	@	.03¾
O. D. Khaki	.03	@	.03¾
Corduroy	.01¾	@	.02
New Canvas	—	@	.05
B.V.D. Cuttings	—	@	.06¼
Paper Mill Bagging	1.10	@	1.25

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	—	@	2.75
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues	1.50	@	2.00
Thirds and Blues—			
Repacked	1.37½	@	1.75
Miscellaneous	1.25	@	1.62½
Black Stockings	2.50	@	3.00
Roofing Stock—			
No. 1	1.50	@	1.60
No. 2	1.25	@	1.30
No. 3	1.05	@	1.10

Foreign Rags
(F. o. b. Boston)

Dark Cottons	1.60	@	1.70
New White Shirt Cuttings	5.50	@	6.00
Dutch Blues	2.25	@	2.50
New Checks & Blues	2.50	@	3.00
Old Fustians	1.90	@	—
Old Linsey Garments	1.10	@	—
New Silesias	4.75	@	—

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.11	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.12	@	—
No. 2 Colored	.09	@	—
Ledgers (sulphite)—			
Ledgers, No. 1	.34½	@	—
Ledgers, No. 2	.25½	@	—
Writing	.09	@	.09½
Book—			
No. 1 M. F. (Carloads)	6.50	@	—
No. 2 M. F. (Carloads)	6.00	@	—
No. 3 M. F. (Carloads)	5.50	@	—
No. 1 S. C. (Carloads)	7.00	@	—
No. 2 S. C. (Carloads)	6.50	@	—
No. 3 S. C. (Carloads)	5.20	@	—
No. 1 Coated and Litho	12.00	@	—
No. 2 Coated and Litho	10.50	@	—
No. 3 Coated and Litho	9.50	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown	4.75	@	—
White Wrap	3.50	@	—
"B" Manila	5.25	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft, No. 2	5.40	@	—

(F. o. b. Cars Toronto)

News, per ton—			
Rolls (contract)	39.50	@	—
Sheets	44.50	@	—

Pulp

Ground wood	27.00	@	—
Unbleached Sulphite	42.00	@	—
Book (Class 1)	58.00	@	—
Writing (Class 2)	59.00	@	—
Select (Class 3)	60.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.00	@	2.30
Soft White	1.60	@	1.90
White Blk. News	1.25	@	1.40
Book and Ledger—			
Flat Magazine and Book Stock (old)	.90	@	1.00
Light and Crumpled Book Stock	.80	@	.90
Ledgers and Writings	1.00	@	1.05
Manilas—			
New Manila Cut	1.25	@	1.40
Printed Manilas	.50	@	.60
Kraft	1.00	@	1.60
News and Scrap—			
Strictly Overissue	.60	@	—
Strictly Folded	.50	@	—
No. 1 Mixed Paper	.40	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.05	@	—
Fancy Shirt Cuttings	.02	@	—

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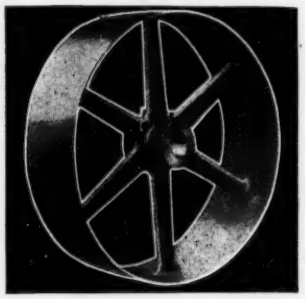

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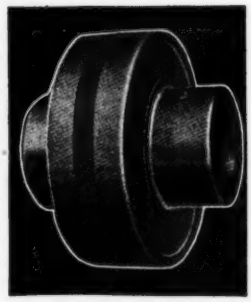

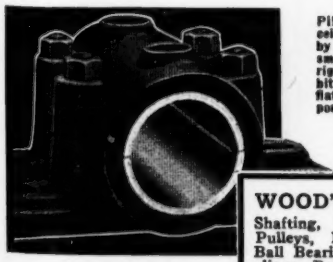

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